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THE BLANDY PORTABLE STEAM ENGINE.

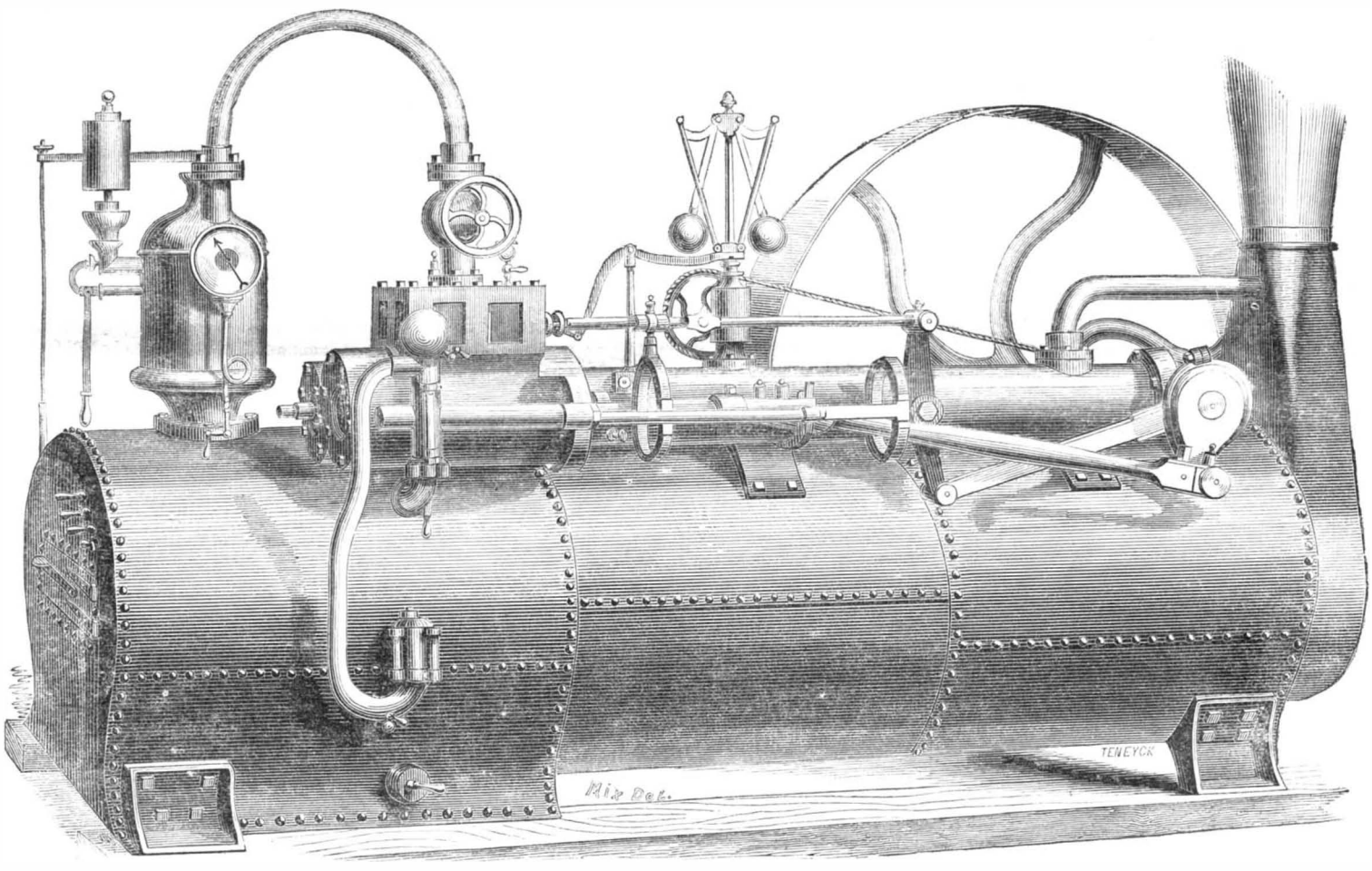
The aggregate horse-power of small steam engines demanded by a community is much greater than that of large ones. This is one manifestation of a pretty general law, which is shown in the greater amount of *local* than of *through* business of railroads—in the excess of the aggregate of small properties over the sum of the great fortunes, and in numerous other ways. When we couple these facts with the transcendent importance of the steam engine, we are prepared to realize the immense extent of the manufacture of portable steam engines, and are not surprised at the statement that the success of the firm whose engine we here illustrate is surpassed only by that of the sewing machine manufacturers.

The leading peculiarity of this engine consists in the bedplate, *which, for a 20-horse power engine*, weighs 320 lbs. only, and is strictly a cast iron pipe, the form combining the greatest strength with the least weight of metal, and having, on one side, seats for its own attachment to its permanent seats on the boiler, the separate faces of which are planed and united by bolts; on another side, seats and faces for the attachment of *all the working parts of a steam engine!* One end of the pipe bedplate is closed by one of the plumber blocks of the main shaft, the other by a cover with projecting nozzle, through which the supply water is conveyed into the interior of the bedplate, where it is heated by the exhaust or escaping steam, conveyed through its own separate pipe, *through the interior of the bedplate*, on its way to the smoke-stack, where it is used to fan the fire! It will thus be seen that the bedplate is really a very curious and useful affair; not an inch of useless or unoccupied surface, inside or out; not a pound of metal employed not necessary to its integrity as a common pipe. The bedplate effectually and perfectly isolates the working parts from the boiler, and fixes their relations to each other so perfectly that they are absolutely unaffected by the variations of the boiler in passing from cold to steam at any safe pressure. The engine is so erected that, in taking down the whole of the separate parts, or any single part, or the bedplate carrying the whole engine from the boiler, everything must go back to its own proper place, and cannot be put in any other, as no "dutchmen," or liners are employed; and all without disturbing a bolt passing through the boiler sheets—the surfaces being planed. Permanent pins and studs are used in attaching the separate parts to the bedplate. Notwithstanding the interior of the bedplate is used as a heater, and the stream of cold water constantly passing into it serves to preserve a lower and equal temperature, still it is not necessarily used as a heater. The water may be introduced directly into the boiler. There is on the boiler a cold water lifting and forcing pump, worked by a band from the main shaft, and, by clutch coupling, thrown into or out of gear instantly.

The boiler of the Blandy Steam Engine, like the bedplate, is peculiar; of symmetrical proportions, nearly cylindrical in outline, with ample furnace inside, entirely surrounded by water space, and large open grate surface; the larger sizes receiving common cord wood, and all sizes burning wood, coal and coke equally well.

Though so compact, the engine has all the separate parts ever attached to any high pressure engine—globe throttle, governor, steam gage, whistle, heater, &c.; and all so skillfully and artistically combined that no motion of the boiler ever disturbs the relations between it and the separate parts of the engine. For sawmill, mechanical, manufacturing and printing-office purposes, the boiler is furnished with cast iron feet; for planters' and farmers' use, it is mounted on wheels, with locomotive smoke-stack, spark deflector, wire gauze, &c., to make it safe among the combustibles where its services are performed. But, however excellent, theoretically, any new discovery may appear, its true value is only determined by the unerring test of experience. The Blandy Portable Steam Engine has fully sustained itself in practical operation, and has achieved the most brilliant results in sawing lumber—the hardest possible work for any engine. Besides, it obtained the first premium at the Ohio State Fairs for 1857 and 1858; and the first regular premium for a farm engine, and an extra, special and only premium for a sawmill engine (silver medal and $20) for 1859.

The Blandy Portable Steam Engine affords another illustration of the tendency to simplicity in all progress in the mechanic arts, and is, we think one of the most compact, simple and efficient portable engines ever yet offered to the mechanic, manufacturer, planter and farmer, and quite unsettles the hitherto-acknowledged superiority of the common stationary engine, up to the limit of portability; and time and further experience is needed to define this limit.



THE BLANDY IMPROVED STATIONARY STEAM ENGINE.

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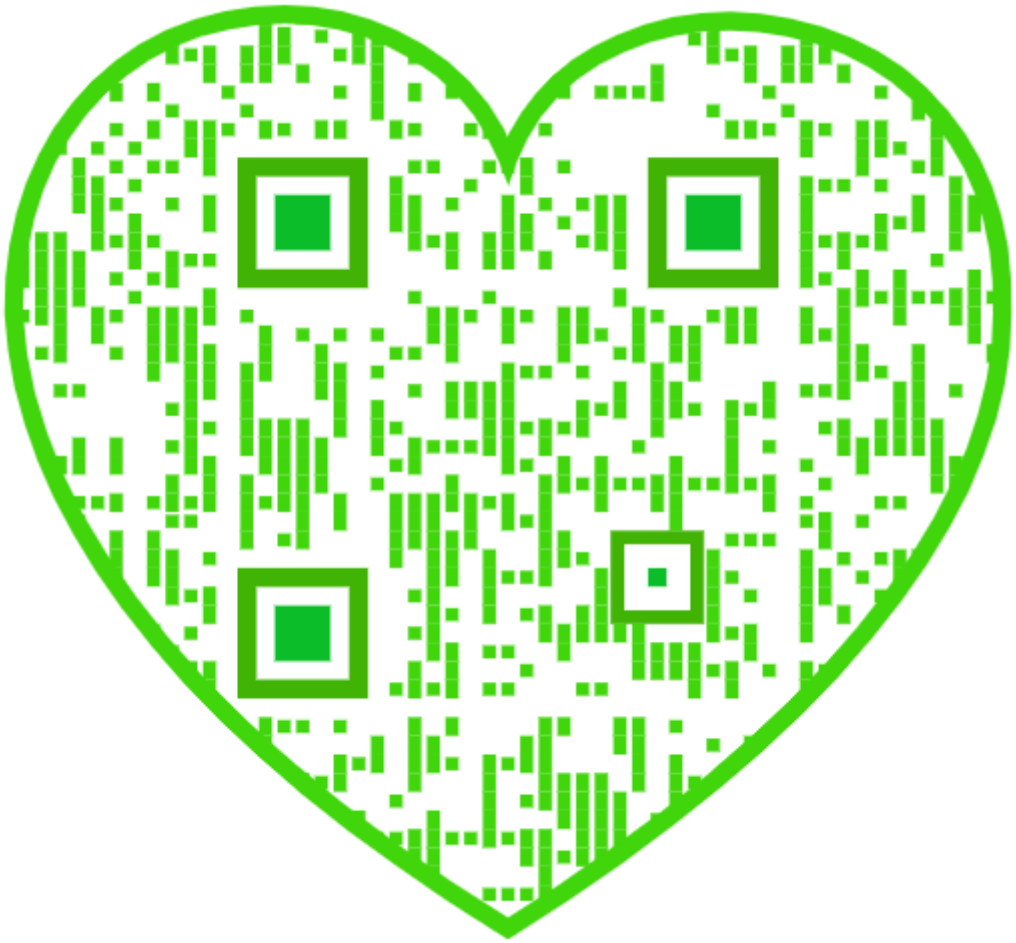

On page 276 will be found an illustration of one of these engines mounted on wheels for farmers' use.

The patent for this invention was issued August 3, 1858; and the claim is for a "hollow continuous bed-plate (without regard to exterior form), the interior of which may or may not be used as a heater." Persons desiring further information in relation to this invention will please address the inventors and manufacturers, H. & F. Blandy, at Zanesville, Ohio.

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

[Reported expressly for the Scientific American.]

On Thursday evening, the 12th inst., the usual weekly meeting of the Polytechnic Association was held at its room in the Cooper Institute, this city; the president, C. Mason, in the chair.

MISCELLANEOUS BUSINESS.

Mono Lake.—Mr. Bruce gave some interesting facts (lately received in letters from his son) about Mono lake, Cal. The lake is about six miles long, and has no visible outlet. The water flows from the circumference to the center, where it seems to descend into some subterranean passage. A person wading in the water and troubled with corns, will be relieved, for the water will soften them so that they can easily be eradicated. The leather of boots and shoes will soon lose its strength and will appear like brown paper. The water is quite alkaline, so that people in the neighborhood wash their clothes in the lake, and are able to dispense with soap. About the lake there is no vegetation, and in it no fish. But a certain kind of fly thrives about the lake, and the nymphæ of this fly have their existence in the water, and are in this season so abundant that the whole lake is covered, and appears like a huge cauldron of indian meal gruel. Thousands of tuns of the larvæ might easily be gathered every year. The Indians about the lake make the larvæ a chief article of food, collecting it and storing it up for winter use. From the larvæ also may be extracted 75 per cent of oil, which is suitable for burning.

The subject was briefly discussed by the president, Dr. Stevens, Professor Hedrick and Mr. Seely, and the statements of Mr. Bruce confirmed. Doubts, however, were expressed of a subterranean outlet, several members preferring to believe that the water evaporated as fast as it flowed in. Specimens of the dried larvæ, which had been received in a letter were passed round and examined. The form of the body was not well enough preserved to be examined by the naked eye; the taste was salt, alkaline and fishy.

Re-election of Professor Mason.—The Committee of Arts and Sciences of the Institute, announced that they had chosen Professor Mason to be president of the club, for the coming year. The choice was approved by a vote of the club.

The president then announced the regular subject:—"Fire-escapes, Ventilation and Iron Buildings."

DISCUSSION ON FIRE-ESCAPES.

Mr. Dibben—The fashion of building is now quite different from that of our fathers. Our buildings are higher, with more wood, and frailer than is desirable. Tenant houses always have narrow staircases, and tower above their neighbors 40 or 50 feet. For this new state of things, we require new apparatus for protection against fire. Hooks and ladders are good enough for buildings two or three stories high, but they are of little service when our six or eight story buildings are on fire. The demand for contrivances for saving property has created an excess of the ordinary fire apparatuses. They get in each other's way, and the streets are often blocked-up with them. We need other contrivances and a different system. The London fire-escape is much talked of, but it will not answer for New York. It is altogether too bulky. In London they build differently. We need for fire-escapes, apparatus that can be carried and managed by a single man, who can operate it without being disturbed or incommoding others, and every engine company might easily carry appliances which could be instantly put in service. The leading ropes of engines should be available when a rope is needed at a fire.

The President—No single apparatus can be adjustable to all emergencies. When the City Hotel was burning, and it was supposed all the occupants had eseaped, a man was seen in one of the attic windows. A rope was dexterously thrown up from the street, was caught, fastened to the window, and by it the man was saved.

Mr. Whittmore—At a fire in San Francisco, it was found that the ladders would not reach the upper stories. Two ladders were then so placed that their upper ends met, and on these as a base another ladder was raised which reached the top of the building. By this means several lives were saved.

DISCUSSION ON VENTILATION.

The President—When we had fire-places there was little said about ventilation, and we show our regard for the old fashion by still keeping the mantles, but unwisely in a pecuniary point of view, for we pay for mantles, under which a fire is never made, enough to procure the very best apparatus for warming.

Professor Hedrick—No system of warming and ventilation will suit all circumstances. What is fit for winter is useless for summer; contrivances for churches and hotels, would be quite unsuited for private dwellings. Stoves are very good when properly used, but they enable us to suffocate ourselves; with the fire-place suffocation is impossible.

Dr. Young—Flues should be built in walls on every every side, and ventilators arranged in many places.

Professor Hedrick would place the ventilators at the bottom, and the hot-air registers at the top.

Mr. Baker advocated ventilating flues traversed by steam pipes, which by the warmth would establish a current.

Mr. Reid—The Romans heated their floors, laid with tiles, so that the heated air rose from every part and secured equal warmth and circuiation.

Mr. Brown elucidated the whole subject by drawings on the blackboard, showing the advantages and disadvantages of the different systems now in use. He advocated the plan of admitting, at the bottom of a room, air heated to about 160°, but never beyond, and opening ventilating flues also at the bottom. He had tested his system with very satisfactory results. He found that a school building, containing 1,500 children, during all the changes of winter, could be uniformly heated and thoroughly ventilated.

Mr. Godwin believed that *power* would in some cases be required to secure thorough ventilation.

The same subjects were ordered for the next meeting.

AMERICAN NAVAL ARCHITECTURE.

[Reported expressly for the Scientific American.]

THE STEAMER S. R. SPAULDING.

This steamer was constructed by Messrs. Harlan, Hollingsworth & Co., of Wilmington, Del., for the Merchants' and Miners' Transportation Company, to ply between the ports of Boston and Baltimore; and she was recently employed to convey the New England delegation to the convention at Charleston, S. C.

As this steamer is securely built, and has, upon her first trip, far exceeded the anticipations of those interested in her erection, we need not apologize to the readers of the SCIENTIFIC AMERICAN for giving minute details of the construction of her hull and machinery, which are as follows:—Length on deck, from fore-part of stem to after-part of stern post, above the spar deck, 214 feet; breadth of beam, at midship section, above the main wales (molded), 33 feet 3 inches; depth of hold, 15 feet 9 inches; depth of hold to spar deck, 24 feet; draft of water at load line, 12 feet; dip of wheel at load line, 7 feet 9 inches; area of immersed section at above draft, 335 square feet; tunnage, 1,092 tuns. Her frame is of wrought iron plates 7-16ths and 13-16ths of an inch in thickness, and securely fastened with rivets $\frac{7}{8}$, $\frac{3}{4}$ and $\frac{5}{8}$ of an inch in diameter every 3, $2\frac{1}{2}$ and 2 inches. Distance of frames apart at centers, 16 and 18 inches. The floors are shaped I (vertical); depth, 20 inches, and thickness of same, 9-16ths of an inch. The shape of keel is U, and it is 13-16ths of an inch in thickness. There are 12 keelsons fore-and-aft, each 20 inches in hight by $\frac{1}{2}$ of an inch and 9-16ths thick.

The *S. R. Spaulding* is fitted with one vertical beam condensing engine; diameter of cylinder, 56 inches; length of stroke of piston, 11 feet 3 inches; diameter of paddle wheels, 31 feet; material of same, iron; number of blades, 26; width of same, 7 feet 8 inches.

This steamer has one return tubular boiler, located in hold; length, 17 feet; width, 16 feet 6 inches, and is 13 feet in hight; the number of furnaces is 4; length of fire bars, 7 feet 8 inches; number of arches, 4; diameter of same, $22\frac{1}{2}$ inches; diameter of tubes, 4 inches. The hight of the smoke pipe is 56 feet above grate surface; diameter of same, 5 feet 6 inches; area of heating surface, 3,225 square feet. The boiler has water bottom, and no blowers to furnaces. All the woodwork around the boiler is protected from communicating fire by iron, felt and tin. The maximum pressure of steam is 25 lbs., cut off at $\frac{1}{2}$ stroke; revolutions at above pressure, 20. Her bunkers are of iron, her water-ways of wood, and she possesses 3 anchors, one smoke pipe, one independent (extra size) steam fire and bilge pump, one bilge injection, and bottom valves or cocks to all openings in her bottom.

Her rig is that of a brigantine. In addition to the above features, she has three water-tight athwartship bulkheads, and is, in every respect, a seaworthy and staunch vessel.

WHAT OUGHT TO BE KNOWN.

How much solid water there is among the flues of boilers as ordinarly set under ordinary firing.

How much water there is in the legs of fire-boxes under the same circumstances.

How much water goes over into the cylinder in case of two domes, one dome, the perforated pipe, and various standard amounts of steam and separating room.

How much average pressure there is in the cylinder before the point of cut-off at quarter-stroke with the link-motion and narrow port.

What shape and size of smoke-arch for a given flue-area and cylinder will allow the largest blast-pipe.

How much combustible gas there is in the smoke-arch under ordinary working, with the various kinds of "smoke-burning engines."

What is the proper counter-balance for the wheels of the various classes of engines, to be ascertained by suspending one of each class by ropes, and working it then and there.

The greatest weight on a given area of journal that will allow a film of oil to remain between it and the box.

How much it costs to stop and start a 25-tun engine and four cars filled.

How much extra fuel it requires to heat through each sixteenth-inch of scale on fire-boxes and tubes.

Whether the pressure on slide-valves is decreased when they are in rapid motion, *i. e.*, whether any film of steam between them and the seats counteracts the pressure above.

What is the relative friction and wear of an ordinarily turned-up and emery-finished iron journal, and a burnished journal of hardened steel under given loads.

This is merely a sample of a few of the problems in railway practice of which a solution is rather important to economy. And if railroad companies would club together and answer them by experiment—all of which is easy and simple—we venture to say it would lead to a saving of a hundred times the cost of the experiments, and ten times the cost of the necessary changes which the experiments would suggest.—*American Railway Review.*

FIRE-ESCAPES—A SUGGESTION.

MESSRS. EDITORS:—I have read several articles in your paper, treating on "Fire-escapes."

I venture to offer for your consideration a suggestion which I have been making for the last fifteen years, but which, although well received, has never had any practical attention. It is this:—Let a law be passed, requiring, in all buildings, on every floor, immediately between the floor and the window, a square opening in the wall, of some 12 by 16 inches, in which will fit a wire ladder, folded, so that a person has only to throw it out of the window, when it will unfold and roll to the ground; one end being fast to the wall inside, the other end can be held, if necessary, some distance from the wall, so that the parties can readily descend or a fireman ascend, pipe in hand. The opening can be covered with a close door, so that this box for the ladder will not be a disfigurement. When it shall be known that every floor in every house will have these ladders, people will, without hesitation, go into and up every house with impunity.

I do not know if I have made myself perfectly understood. If I have, I believe the mode suggested will be found the simplest and most effective of fire-escapes.

W. H. W.

Philadelphia, Pa., April 23, 1860.

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THE MANUFACTURE OF TIN PLATES.

The different processes of the manufacture of tin-plate may be described most properly in seven distinct stages. The first begins with the bars of iron which form the plate; the last terminates with an account of the process of tinning their surface. The description is somewhat technical; but a glance at the following heads will enable the reader to comprehend the whole process:—

1. *Rolling.*—The first and most important point requisite to the production of the *latten*, or plates of iron, previous to the operation of tinning them. For this purpose the finest quality of charcoal iron is invariably employed, which, in its commercial state, generally consists of long flat bars. These are cut into small squares averaging ½ inch in thickness, which are heated repeatedly in a furnace, and as repeatedly passing through iron rollers. A convenient degree of thinness having been obtained, the now extended plates are "doubled up," heated, rolled, opened-out, heated and rolled again, until, at length, the standard thickness of the plate has been reached.

2. *Shearing.*—A pair of massive shears worked by machinery, is now applied to the rugged edges of this lamellar formation of iron-plate. It is cut into oblong squares, 14 inches by 10, and present the appearance of a single plate of iron, beautifully smooth on its surface. A juvenile with a knife soon destroys the appearance, however, and eight plates are produced from the slightly coherent mass.

3. *Scaling.*—This process consists in freeing the iron surface from its oxyd and scoriæ. In the old method this was effected by first immersing the plates in a diluted acid, and then, by exposing them separately, bent in the shape of a drain-tile, to the heat of a flame; but this process, alike tedious and expensive, has long been superseded. After an application of sulphuric acid, a number of plates, to the extent, we shall say, of 600 or 800, are packed in a cast-iron box, a number of which are exposed for some hours to the heat of a furnace. On being opened out after this, the plates are found to have acquired a bright blue steel tint, and in addition to be absolutely free from surface impurities.

4. *Cold Rolling.*—It is impossible that the plates could pass through the last fiery ordeal without becoming disfigured. The cold rolling process corrects this. Each plate is separately passed through a pair of hard polished rollers, screwed tightly together. Not only do the plates acquire from this operation a high degree of smoothness and regularity, but they likewise acquire the peculiar elasticity of hammered metal. One man will cold roll 225,000 plates in a week, and each of them is, on the average, three times passed through the rollers.

5. *Annealing.*—This process is also a modern improvement on the manufacture: 600 plates are again packed into cast iron boxes and exposed to the furnace. There is this difference in the present process from that of scaling—that the boxes must be preserved air-tight, otherwise the contained plates would inevitably weld together and produce a solid mass. The infinitessimal portion of confined air prevents this.

6. *Pickling.*—The plates are again consigned to a bath of diluted acid, till the surface becomes uniformally bright and clean. Some nice manipulation belongs to this process. Each plate is, on its removal from the acid, subjected to a rigid scrutiny by women—their eyes, we presume, are the sharpest—whose vocation it is to detect any remaining impurity, and scour it from the surface. These multifarious and torturing operations, it will be seen, are all preliminary to the last, and the most important of all—that of tinning. Theoretically simple, this process is practically difficult; and to do it full justice would carry us beyond our limits. We shall however, mention the principal features.

7. *Tinning.*—A rectangular cast iron bath, heated from below, and calculated to contain 200 or 300 sheets, and about a tun of pure block tin, is now put in request. A stratum of pyreumatic fat floats upon its surface. Close to the side of this tin pot stands another receptacle, which is filled with melted grease, and contains the prepared plates. On the other side is an empty pot, with a grating; and last of all there is yet another pot, containing a small stratum of melted tin. Let us follow the progress of a single plate. A functionary known as the "washerman," armed with tongs and a hempen brush, withdraws the plate from the bath of tin wherein it has been soaking; and, with a degree of dexterity only to be acquired by long practice, sweeps one side of the plate clean, and then reversing it, repeats the operation. In an instant it is again submerged in the liquid tin, and is then as quickly transferred to the liquid grease. The peculiar use of the hot grease consists in the property it possesses of equalizing the distribution of the tin, of retaining the superfluous metal, and of spreading the remainder equally on the surface of the iron. Still there is left on the plate what we may term a salvage; and this is finally removed by means of the last tin pot, which just contains the necessary quantity of flued metal to melt it off—a smart blow being given at the same moment to assist the disengagement. The "list-mark," may be observed upon every tin plate without exception. We may add here, that an expert washerman will finish 6,000 metallic plates in twelve hours, notwithstanding that each plate is twice washed on both sides, and twice dipped into the melted tin. After some intermediate operations—for we need not continue the consecutive description—the plates are sent to the final operation of cleaning. For this purpose they are rubbed with bran, and dusted upon tables; after which they present the beautiful silvery appearance so characteristic of the best English tin plate. Last of all they reach an individual called the "sorter," who subjects every plate to a strict examination, reject those which are found to be defective; and sends those which are approved to be packed, 300 at a time in the rough wooden boxes, with the cabalistic signs with which the most of us have been familiar since the days of our adventures in the back-shop of the tinsmith. Vessels of tin or of tin plate have rarely been found among Greek and Roman antiquities, although there can be no doubt that the art was at least understood by the ancients. The modern process, our guide informed us as we walked home to dinner, was an importation from Saxony; and it was first introduced into this country at Pontypool, in Monmouthshire, early in the last century.—*London Builder.*

CHINESE GREEN FROM BUCKTHORN.

The famous Chinese green or *lokao*, when upon silk, is the finest green yet known, and is principally remarkable for its brilliancy when seen by candlelight or gaslight. The Chinese have produced this dye for some time past, but their process has remained a secret until very lately. The subject has been investigated by some very celebrated chemists, and it results from their labors that we can not only produce the dye as the Chinese do, but can in a great measure explain its formation. It was first of all discovered that the lokao was obtained by the Chinese from two species of exotic buckthorn (*Rhamnus*), with the bark of which a sort of decoction was made with lime, &c., and that the fabrics, on leaving the bath, were exposed on the grass to the action of light and air. Since these facts were known, experiments have been made upon the colors furnished by our common buckthorn (*Rhamnus frangula*, and *R. cathartica*); and the result has been that these plants, like the Chinese species, can be made to furnish a green color, produced by the action of light, and doubtless identical with the lokao. The bark of the purgative buckthorn is boiled for half-an-hour with a sufficient quantity of water. After cooling, the clear liquor is decanted off, and to it is added its own volume of lime water; the next day a saturated solution of alum is poured in, and twenty-four hours later some carbonate of soda. After an hour or two of quiet, the clear liquor is decanted or filtered off. The solution is then fit for dying green; it is of a yellow color, and when exposed in shallow basins to the action of the sun, it deposits the lokao, which, like that of the Chinese, is soluble in acetic acid, by which means it may be purified, as it is precipitated again by ammonia. The substance which gives birth to this green dye is an unknown colorless body, which, by the influence of light, becomes green. In France, 10,000 francs were offered for the production of lokao, but I do not think the prize will be awarded, as the subject has been investigated by so many scientific men, and with such remarkable results, that the 10,000 francs could only be divided among them, and the sum is too small for such a division.

An admirable quality in colors such as those just spoken of is, that, being produced by the direct agency of light, they cannot be decomposed or spoiled by exposure to it, as is the case with many of our most costly dyes produced by other means.—*London Photographic News.*

AMERICAN TELESCOPES—THE TWIST IN THE GRAIN OF TREES.

MESSRS. EDITORS:—From your "Notes and Queries," upon page 206 of the present volume of the SCIENTIFIC AMERICAN, it appears that F. F. (of Kansas) wishes to learn where he can get a good astronomical telescope at a low price. Perhaps my experience will help him. After protracted inquiries, I purchased one of Mr. Henry Fitz, residing at No. 237 Fifth-street, in your city. He made me a beautiful achromatic instrument, having a heavy brass body of four inches aperture and five feet focal distance, *equatorially* mounted, with one *pancratic* terrestrial eye-piece and four celestial eye-pieces, a glass prism for vertical and elevated objects, sun shade, &c., for $240. The price, with a wooden body, would have been only $225. These are about *one-half* of the usual prices for similar telescopes made in London and Munich. The telescope which Mr. Fitz made for the Ann Arbor (Mich.) Observatory, of 12-inch aperture, cost $6,750. The Munich instrument at the Mount Adams Observatory (Cincinnati, Ohio) cost about $10,000, and is nearly the same size. For further particulars in regard to the Fitz telescopes, I would refer your correspondent to Burritt's "Geography of the Heavens," pages 317 to 321 (edition of 1858). I may add that Mr. Fitz is more particular to do his work well than to have it finished at the exact time promised.

By the by, Messrs. Editors, it seems to be a new idea to you, that the twist of trees *generally* turns in the same direction as the sun. My observation has been more particularly upon pines. Chip a pine at the stump hight, and if it twists or winds with the sun, leave it, for it will not do for shingles; the higher up you try it, the more you will find it to wind. On the contrary, if it winds *against* the course of the sun, the twist will run out in some 10 feet, and the grain then either continues straight to the remainder of the length, or perhaps even turns and winds *with* the sun, near the top of the tree. This is a fact which is no less true than curious.

J. H. ANDREWS.

Almont, Mich., April 21, 1860.

TO COAT IRON WITH BRASS.—There are two processes by which this operation may be accomplished. One is to cleanse the surface of the iron perfectly from grease and oxyd, and then to plunge it into melted brass. The cleansing is best done first with a ley of soda, or potash and water; when placing the iron for a short time in weak sulphuric acid and water, the metal being bright, may then be dipped into the fluid brass, and the thin coating of brass, thus adhering to the iron, afterwards polished and burnished. The electropying process is, however, now mostly adoped by manufacturers. A solution of brass is first made thus:—Three quarters of a pound of cyanide of potassium, one and a half ounces of cyanide of copper, and three quarters of an ounce of cyanide of zinc, dissolved in one gallon of clear rain water, to which finally add one and a half ounce of muriate of ammonia (sal-ammoniac). This liquid is then to be used hot (not scalding, say 180° Fah.) in this manner; the iron to be coated is attached or connected with the zinc end of a battery of moderate power, and a piece of good brass is fastened in like manner to the opposite pole; both the metals are then to be immersed in the hot brassy solution, and there left undisturbed for such time as is deemed necessary, and the iron will become coated with brass of a thickness according to the time it is left in the solution. Burnishing and polishing are afterwards required, according to the particular nature of the work. The texture and tone of color of the brass vary with the temperature of the solution and quantity of materials employed, &c. By a small jet of gas or other contrivance, the liquid must be kept hot during the whole process.—*Septimus Piesse.*

PATENT REFRIGERATORS.—For some time past a suit has been in progress before Judge Pitman, in the United States Circuit Court of Providence, between J. C. Schooley, of Cincinnati, and Charles Winship, of New Haven, for an infringement of Schooley's patent refrigerator. The case was warmly contested on both sides, as it involved important interests to both parties. Judge Pitman has decided the case in favor of Winship, and affirms the validity of his patent, which was secured through the Scientific American Patent Agency.

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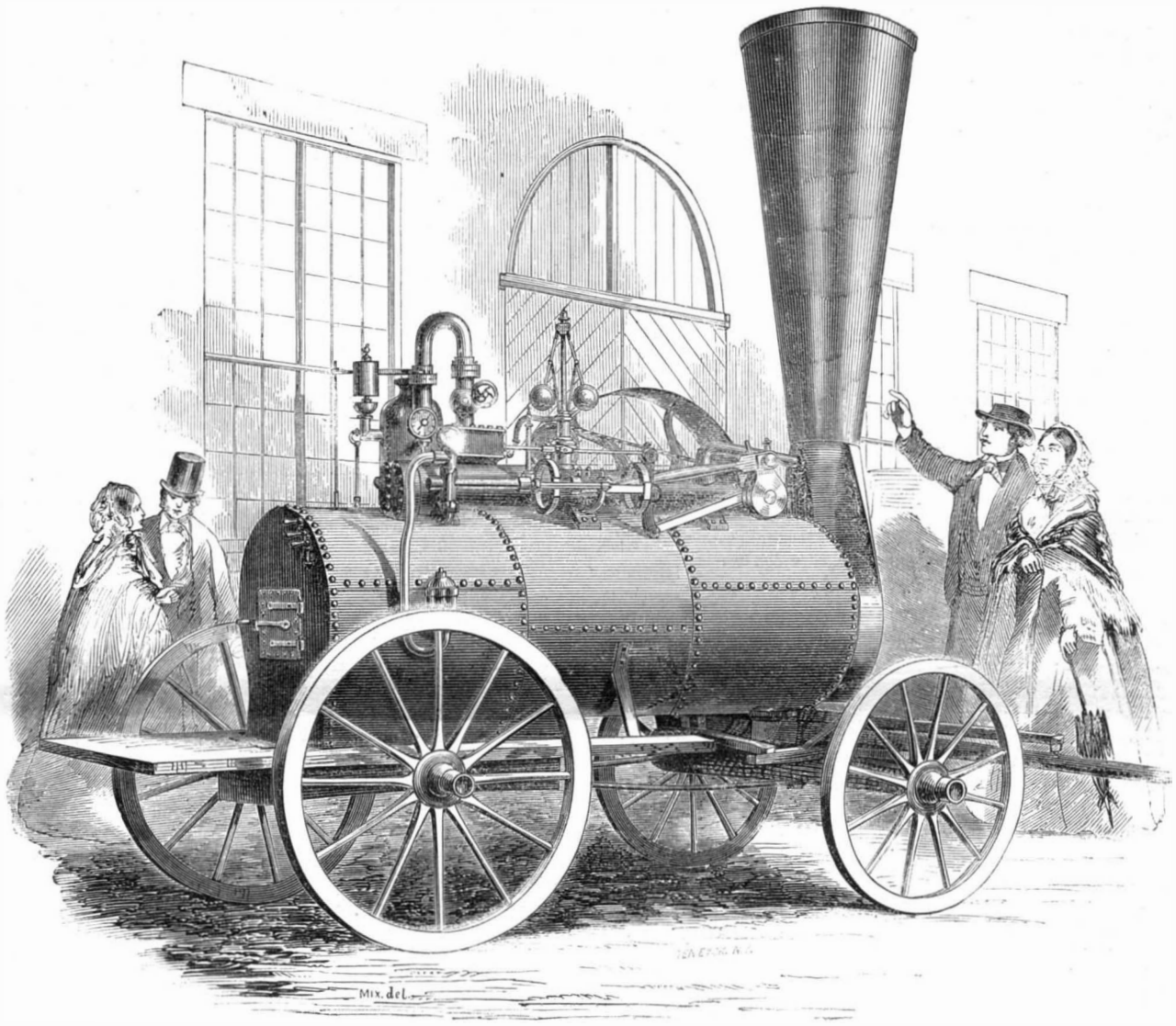
COTTON MACHINERY INVENTIONS.

The last number of the London *Quarterly Review* contains some very interesting reminiscences of the early inventors of cotton machinery; and, in contrasting the past with the present, the conclusion is inevitable, that inventors of the present day live in a millennial age, in comparison with their predecessors of the past century. At one period, it was a common practice to persecute inventors of labor-saving machinery; now they are justly esteemed, and their inventions frequently entitle them to wealth and honorable distinction. The greatest single manufacturing interest in the world is that of cotton—all others stand far below it in comparison. It is America's chief surplus product, and England's greatest textile agent. Its history is like a romance; its recent rapid development seems like a miraculous achievement. In 1770, only seven bales of American cotton were imported into England; in 1859 no less than 2,085,000 were imported, and this amounted to more than four-fifths of England's total supply. This manufacture has been the means of creating large cities, and converting barren fields into busy hives of industry; and it has afforded immense revenues in times of war, and great profits in seasons of peace.

A recent number of the London *Times* states that the net profits of the Manchester cotton manufacturers exceed one million pounds sterling per month, after all expenses—ordinary and extraordinary—are paid. Lancashire, in England, is the cotton workshop of the world; and for this it is indebted to its people—its inventors—not its position, soil or climate. One century ago, this county of England was almost a wilderness; Manchester then contained but a few thousand inhabitants, who dwelt in miserable houses, and who were both poorly clad and fed. At present there is a population of 3,000,000 contained within a circle of a few miles around it; its wealth is enormous, and many of its buildings are of the most splendid character. Liverpool, which is also in this county is now the greatest seaport in the British empire; while, 100 years ago, it was little better than a miserable fishing village. All this has been done by inventors of cotton machinery; and we will give a brief review of some of their achievements.

Six score years ago, exactly, all the operations of spinning and weaving were performed by the hand wheel and the old loom in the cottages of the peasantry, and the work which each operative could execute was very limited. The first great improvement for increasing the amount of work was effected by John Kay, of Bury, who secured a patent in 1733, for what is called the "fly shuttle." The old way of operating the shuttle was exactly like that now employed in weaving rag carpets. The shuttle is thrown with one hand through the cleft of the warp; then the lay is driven up to beat in the thread, when the shuttle is again thrown with the opposite hand through the warp; and so on continually. The improvement consisted in operating the shuttle without ever touching it by hand, through the means of a sliding head, connected by cords to a handle, which was operated back and forth with one hand while the other operated the lay. This improvement enabled the weaver to execute double the amount of work in the same time, and with greater ease How was John Kay rewarded for his most useful invention? The Yorkshire cloth manufacturers formed associations to resist payment for the use of the patent, and they at last ruined the inventor by expensive lawsuits. After this, John Kay invented an improved loom and a carding machine, for the spirit of invention would not allow him to rest; but so prejudiced were the brutal hand-workers against the innovations of labor-saving machinery that a mob broke into his house in 1753, and smashed all his machines, while he barely escaped with his life. His native land, to which he was one of its greatest benefactors, threw him off; and he fled to France, where he died, a few years afterwards, in great poverty. Such was poor Kay's experience at the hands of his then ignorant countrymen.



THE BLANDY PORTABLE STEAM ENGINE. [See page 274.]

The next great improvement in cotton machinery was in the spinning operation. After the hand loom had become so much improved by Kay, the weavers had frequently to wait for supplies of yarn from the spinners, who still whirled away with only one spindle each, while they drew out the cotton into thin slivers with their fingers and thumbs. Lewis Paul, of London, first invented a machine to spin several threads at one operation; but his *frame* never operated successfully. Thomas Higby and James Hargreaves appeared to have invented what is called the "spinning jenny," about the same time, and unknown to one another. It consisted in feeding-in the cotton fillets between a pair of rolls, from which they passed in slivers to twisting flyers, and thence on to spindles. About 20 spindles were used on the first machine that was tried; and by simply turning a crank, 20 threads were spun at once. This was a grand improvement, but neither of these inventors were benefited by it. Hargreaves also had his house broken into by a mob, and he was compelled to fly from their vengeance. The manufacturers treated him no better than the operatives; they formed associations to resist his patent rights, and they succeeded in their base designs. He died in poverty; and his descendants afterwards became dependent on public charity in that very city of Manchester which his genius had contributed to enrich.

The next improvement in cotton-spinning machinery was effected by Richard Arkwright, who was originally a poor barber. He placed two pairs of rollers on the spinning frame, and, by giving the front pair a higher velocity than the back set, the thread was drawn out much thinner to the flyer; and thus much finer yarn was spun. Richard was also compelled to fly from a mob on one occasion, and for a long time he struggled against opposition and *ill luck*; but he had a stout heart, and at last he triumphed over all difficulties, saw his invention generally introduced, and was ultimately "crowned with riches and honors nobly won."

The next improver of cotton-spinning machinery was Samuel Crompton, an English weaver. He invented what is called the "mule frame," and produced much finer yarn than had ever been done before. This invention was also pirated by English manufacturers; and several wealthy parties who agreed to pay him certain sums annually for the use of his machine, afterwards repudiated their engagements, and the descendents of these men are now the great cotton lords of Lancashire. Poor Crompton also died in poverty. In disposition he was sensitive; and, although possessed of great mechanical genius, he was not well calculated to battle with wicked men in this world. His machine has surpassed all those of his predecessors for fine spinning, as there are 13 mule spindles used for every one on "throstle frames."

In 1779, a furious infatuation broke out against machinery in England, which displayed itself in violent mobs. Hundreds of factories were destroyed in that year, and the machinery in them broken to pieces. These outrages were winked at by the higher landlord classes, who dreaded the approaching industrial revolution of machinery, and the apparent rise in wealth and power of the manufacturing classes. These days of mobbing inventors have passed forever; all classes are

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now sufficiently enlighted to recognize labor-saving machines as one of the greatest boons conferred on the human race.

As cotton machinery is very extensive in its range and character, we have only been able to devote space to the efforts of the early inventors; but these were the very men that established this great manufacture.

The mule spinning frame used to have its carriage moved by hand; but what is called the "iron man," or self-acting mule, was invented several years ago by Richard Roberts, of Manchester, to supersede the hand carriage. This it has done in many instances; but we understand that these mules do not yet make such good yarns as the old frames. Quite a number of useful improvements have been invented in America on cotton machinery. The "cop-spinner" of Danforth and the "ring-traveler" spindle of James Bogardus (patented in 1830), have come into very general use on throstle frames. McCulley's "Niagara throstle," in which the spindles are driven by friction instead of belts, and the mule of Mr. Mason, of Taunton, Mass., are esteemed in American cotton factories to be far superior, in their arrangements for the comfort of the operatives, to those of any other country; but, although we have made so many improvements in machinery, we do not make any of the finest kinds of cotton cloth. Without fine yarn, we cannot do it, and none of the higher numbers are spun in our factories. So far as we have examined personally, it appears to us that the sheetings manufactured at the New York Mills, Oneida county, N. Y., are the finest cotton goods made in America. The yarn is all spun on mule frames, and the fabrics are very beautiful. We must admit, however, that while the finest American yarns do not extend beyond what called are Nos. 60 and 80, large quantities of No. 240 are spun in England; and some have been made as high as No. 700. A pound weight of the latter will extend 334 miles in a single thread—wonderful perfection in machinery is required to produce such a result. When shall we reach this figure in our American factories? We believe there is a great and hopeful field before our cotton manufacturers, especially in the manufacture of fine yarns. A pound o. cotton valued at 25 cents, first made into thread (in England), then into lace, is increased in value to $2,000. There was a time when the fine muslins of Hindoostan, which were spun and woven by skillful hand labor, were supposed to be unapproachable; but the genius of man has at last invented iron fingers that produce gossamer threads far outrivaling in beauty and delicacy, the most skillful productions of oriental climes.

PATENT EXTENSIONS BEFORE CONGRESS.

Locomotive Wheels,—It appears from the published proceedings of the Senate, for the 12th inst. (an official report of which is now before us), that Thatcher Perkins and William McMahon have asked for an extension of their patent, granted April 10, 1843, for an improvement in the wheels of locomotive engines. The claim of this patent is "the fitting of a chilled cast iron rim on to an inner rim, cast with the spoke, by making the inner surface of the former and the outer surface of the latter slightly conical, and binding them together with screw bolts." This patent expired April 10, 1857, and is now the property of the public. The Committee on Patents have reported a bill for the extension of this patent, which has passed to a second reading.

Steam Boilers.—It appears, also, that Jane B. Evans, executrix of Cadwalader Evans, deceased, has applied for the extension of a patent granted to her late husband. What this particular application is we are unable to say, as the title of the invention is not given; but we presume, from the nature of the other inventions patented by the late Mr. Evans, that it relates to steam boilers, as he took out several patents for improvements in this class.

REMARKS.

We would call the attention of the committee to the fact that, after a patent has expired, it becomes the property of the public, and there is no law in existence by which the public can be deprived of the right to hold that which has reverted to its use by due process of law. When a patent has expired, the legal ownership in the invention passes to the public; and in case Congress should extend the patent by a process known as a "relief bill," it would be acting on the principle of "robbing Peter to pay Paul." The patent laws enacted by Congress provide for the extension of patents under the authority of the Commissioner of Patents; and whenever this power ceases, it seems to us that there is no other relief, unless Congress interposes its authority *before* the patent expires. We believe that Congress may legitimately interpose its authority to extend and keep alive a patent before it expires; but when it *ceases* to live, Congress would be inflicting great injustice by undertaking to raise it from the dead and restore it to its former possessors.

Upon this subject—the extension of patents—our position is perfectly plain. We will, however, re state it in a few words. Our general laws allow the Commissioner of Patents to grant a patent for the term of 14 years, with the power to prolong it for another period of 7 years, under certain conditions. If the invention is valuable, it usually requires about one-half the first term of the patent to get it before the public; and when this is accomplished, it often takes about the whole of the remaining seven years to establish its validity against infringers. There are, in reality, but few valuable inventions which ought not to be extended, and it is one of the brightest spots in the history of the Patent Office that it has seldom failed to recognize the right of an inventor to the extension of his patent, by process of law, for any useful improvement in the arts. If the applicant has a good invention and an equitable case, he will scarcely fail to obtain an extension of his patent, if it is carefully prepared and judiciously managed. The public, also, who feel interested in opposing the extension are duly notified in the public prints, and can appear before the Office with testimony and argument, and contest its right to the extension. Not so, however, with cases before Congress; the public have no means of knowing what is going on in that body, respecting the extension of patents—they will look in vain in the reports of the daily papers for such information; therefore, those who might desire to remonstrate are ignorant of the application. We sincerely hope that Congress will not establish the dangerous precedent of reviving dead patents.

DEATH OF HON. CHAS. STEARNS.

On reading the obituary of Mr. Stearns, in a recent number of the *Springfield* (Mass.) *Republican*, our memory went back to the period when we first made the acquaintance of the deceased, eighteen years ago. Mr. Stearns was not a young man at that time, and the writer of this was not then out of his teens; but time has not effaced from his memory the many acts of kindness received at his hands. The city of Springfield has lost in the deceased one to whom she is more indebted for her prosperity and growth than to any other single individual who has ever been identified with the place; and we trust that its good citizens will exhibit their public spirit by taking upon themselves the responsibility of erecting a monument to his memory in their beautiful cemetery which, we believe, he was active in forming. The following we extract from the obituary notice in the paper referred to:—"The death of Mr. Stearns, at the ripe age of 71, closes a career at once eventful, active and extended. He was born in Lancaster, Mass., and learned the trade of mason in Boston. He came to Springfield in 1812, and began and perfected here the business of his life. For a considerable number of years, he was the master-mason of the place, while Simon Sanborn was the master-carpenter, and excellent workmen were they both. At an early period in his business career, he became an operator in real estate, and probably no man has lived in the town who has built and owned so many houses as he. At one time, he had a large number of tenants, and it was his stereotyped reply to applicants for tenements, when all were occupied, that he "had none, but could build one immediately." Mr. Stearns was always a ready and willing worker in every public enterprise. He was very active in procuring the experimental surveys for the Western Railroad, and in getting subscriptions to the stock. In fact, there was hardly a man upon the line to whose energy and enterprise that great work was more indebted for its inception and completion than to his. The Springfield Aqueduct Company was also a child of his begetting. The starting of the Indian Orchard enterprise is also traceable to him, we believe. It would be impossible for us to recall all the matters into which he has entered as an active power. There was a time when Charles Stearns was in everything. Nor were his business talent, sound sense and untiring industry unappreciated by his fellow-citizens. He was elected a member of the State Senate in 1845, and has represented the town, we believe, more than once in the lower branch of the Legislature. In the closing months of his life, he was engaged upon a history of Springfield, which, we believe, is nearly ready for publication. It occupied much of his thought during his closing days."

THE CATTLE DISEASE IN MASSACHUSETTS.

This terrible epidemic, by its continuous spreading, threatens to become one of the greatest scourges that has ever visited the country. The imagination is appalled at the contemplation of the thousands of herds from Maine to Texas being visited by this wasting and fatal malady. The suffering and anxiety from the loss of property and from the dread of its loss among the agricultural community, and the fear of diseased meat in all our cities, may be partly conceived but cannot be fully realized. It seems that the Legislature of the State has been aroused to the importance of the matter. A law has been passed for the appointment of three commissioners to investigate the subject, and authority has been given them to have slaughtered, at the expense of the State, all the cattle that are sick or that have been exposed to the contagion, to have their bodies buried and the barns in which they have been kept purified—even burning the hay if the commissioners think it necessary.

The commissioners are Richard S. Fay, of Lynn, Mass.; Paoli Lathrop, of South Hadley, Mass.; and Amasa Walker, of North Brookfield, Mass. They have caused fourteen animals to be killed, that they might trace the progress and character of the disease in all its stages. It is purely a disease of the lungs, affecting the animal in no other organ, and seems to be certainly contagious. A cow that died the night before the commissioners arrived was examined, and both her lungs were a mass of frothy, cheesy corruption. One cow that was taken sick so long ago as the 1st of January, and seemed to be recovering, appearing bright and healthy, was slaughtered; the left lobe of the lungs was sound, but from the right was taken a mass of pus, looking like rotten cheese, of more than a pint in measurement. She might possibly have thrown off the disease and lived, had she not been killed. Another cow in the same herd, and showing stronger signs of the disease, had a similar but greater mass of pus in the lungs, and with it a large amount of watery fluid. An ox that looked bright and well, and ate and chewed his cud as if in a healthy condition, was among the slain, and one of his lungs was a mass of corruption. Another singular case was that of a cow that calved some ten days ago; one lung was healthy, but in the other the disease was developing itself in scattered balls or masses of pus, looking like liver on the outside, but, on cutting, like rotten cheese; and her calf was found to have the disease in precisely a similar stage. The presence of the disease is detected by the breathing of the animal which makes a croupy noise or like breathing through a quill.

It is to be hoped that these energetic measures are not too late, and it is especially to be desired that the commissioners will allow no childish weakness to prevent the thorough and efficient discharge of their momentous duties. Contagion is so subtle in its nature, and is scattered abroad by such widely pervading agencies, that we shall be agreeably disappointed if any human power is able to arrest the spread of this deadly pestilence.

THE LIGHTNING CALCULATOR.

One of the most amusing and astonishing exhibitions of mental power that we have ever seen is the addition of a row of figures by Professor Wm. S. Hutchings, the mathematical phenomenon. During his absence from the room, several rows of figures are entered upon a board, and on his return, he picks up the chalk, and, giving it a whirl in the air, with a sort of convulsion, he announces the sum of the first column, setting down the digit. Another whirl of the hand and down goes the next figure, and thus the several columns are added, almost instantly; the operation exciting the wonder of the spectators. He also performs multiplication and the squaring of large numbers with marvelous quickness, setting down the result in a single row of figures. We have examined his processes, and are satisfied that almost any of our intelligent accountants, who are pretty quick at figures, might learn to calculate with nearly the same rapidity.

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INTERESTING CORRESPONDENCE.

COTTON GINS---ATMOSPHERIC ELECTRICAL CURRENTS.

MESSRS. EDITORS:—I noticed a suggestion in a recent number of the SCIENTIFIC AMERICAN, in reference to a much-needed improvement in the cotton gin. During a late tour through some of the southern States, I was struck with the want of another improvement in the cotton gin, which will enable it to clean the dirty cotton that has fallen and been gathered from the ground.

Allow me to state to you some facts proving, I think, the existence of both ascending and descending currents of atmospheric electricity during the same thunderstorm and near the same time.

During a thunderstorm in May last, the lightning struck a three-story brick block at the corner, threw out perhaps 50 bricks, and tore down the tin conductor standing at that corner. No effect of the lightning could be found below the top of the corner of the building except the prostration of the conductor, and no evidence of fusion upon that. At the same instant, Judge Dickey, who was on the sidewalk more than a quarter of a mile north, very sensibly felt the effects of the current passing from his shoulder down. This last circumstance, I think, proves conclusively that this was a descending current of electricity. My house is situated upon an elevation one hundred feet above the city, and one and a quarter miles north of the brick block spoken of. In my office at the house, I have a telegraph instrument connected with the main circuit, about two hundred miles long. The office wires, very near the table, were, at the time, very near but not quite in contact with the gas pipe, which I use for a ground wire when necesssary. I have a cut-off, 12 feet outside the office (which was closed at the time), separating the office wires from the main line two inches. The cut-off is so arranged that the office wires were separated from each other four inches at that point. Both the main circuit and office wires connecting with the cut-off are No. 17 copper, consequently of equal connecting capacity. During the continuance of the storm and, as near as I could judge, about the time the building in town was struck, a member of my family went to the office in search of two small children, and found them looking, as they said, at the fire on the telegraph table. At that time there was a succession of slight reports and flashes about the table, and after the storm was over I found marks of the electricity, both on the gas fixtures and wires where they were nearest in contact, and upon the wires in several other places about the table and in the magnet, and between the office and cut-off, the wire was completely fused and parted. After the storm was over I repaired the damages, opened the cut-off and found the line working actively, and that distant offices on either side had been working regularly through my cut-off with very little interruption from atmospheric electricity. This was clearly ascending electricity.

About one hundred yards west of my house, and say fifteen minutes after the building in town was struck, a cherry tree (four inches in diameter) was struck, which I examined soon after the storm passed. Five feet from the ground the tree forks into two equal parts. On the north side of the tree the bark was torn off from a point fifteen inches from the ground to the forks. The denuded portion was from two to four inches wide. Along the middle of this strip, and extending its whole length, the trunk of the tree was split to an uncertain depth, and from this fracture, along its whole course, were projected splinters of from one to two inches in length, and standing uniformly at right angles to the trunk of the tree. Not a scratch was found upon any of the branches. The tree matured a fair crop of fruit, and is now well set with fruit buds, which are considerably swollen, though not as far advanced as its healthy neighbor. The trunk of the tree below the injury has since increased in diameter more than half an inch. The bark on either side of that thrown off was loosened from the tree, so as to leave a strip not more than from two and a half to four inches uninjured, and on the inside of the bark thus loosened from the tree solid wood has formed, in thickness more than half an inch, and in one place more than two inches. The observations which I made immediately after the storm, and which I have detailed, convince me that a current of electricity passed up the tree and burst out from it before reached the branches; and I have mentioned the growth of the tree since as something quite remarkable, so far as my observation extends. I have been tediously minute in every detail; yet, perhaps, not as much so as I aught, as the minutest circumstance is worthy of notice in such observations.

J. D. CATON.

Ottawa, Ill., April 5, 1860.

REPAIRING CRACKED BELLS.

MESSRS. EDITORS:—You are, of course, aware that the usual course pursued with cracked bells is to saw out the crack; but this operation greatly weakens the bell, while the tone is never completely restored. We wish to give you a brief statement of an experiment made by us with a cracked bell, which was entirely successful, namely, the fusing of the injured parts. We conducted the operation as follows:—The bell was buried in the sand, deep enough to make it easy to work upon, leaving the crack and several inches around it exposed. Then the half of a flask or box was placed on the exposed part, which was nearly in a horizontal position. The flask was then filled with molding sand, as in any ordinary mold, leaving the crack and a portion of the bell exposed for several inches around; we then placed parting sand on the mold, as is usually done, and placed another part of a flask to match that already on the bell—usually called the "cope"—which was filled with sand so as to have a body several inches above the topmost portion of the crack. This was then removed, retaining the exact shape of the fractured portion of the bell. A receiving and discharging gate was then cut into the cope at each end of the crack; also, a channel, one inch wide and one inch high, for the metal to flow through from the receiving to the discharging gate, in a line with the crack. The inside of the bell was then filled and well-rammed with sand, so as to support that portion of the bell when in a melted state, and also to support the outer portion of the flask as the sand is filled out further than the edge of the bell. The cope was then dried, and a charcoal fire made on the cracked portion of the bell, while exposed, for the purpose of creating as much expansion as possible and getting the metal into a red heat, so that the metal, when poured, would do its work more quickly and not be as liable to crack the bell further up, or in another direction, as it would be if this precaution were not taken. The fire was then removed, the dust and ashes blown away with bellows, and *the crack cleared out clean.* The cope was then placed back on the other portion of the mold, on the bell, and weighted down to keep it from rising while the metal was being poured through the channel. The crucible containing the molten metal was then taken from the furnace; it should always be very hot, and ready to use as soon as the cope is placed on the bell. The metal was then poured into the receiving gate, and flowed through the channel over the crack in a continual stream, until the cracked portions, and several inches around it, were in a molten state and completely fused. The bell was then allowed to cool. The amount of metal poured was from 50 to 60 lbs., the weight of the bell was about 200 lbs., and the crack about 7 inches long, from the mouth upwards.

W. T. & J. GARRATT.

San Francisco, Cal., March 30, 1860.

PREVENTING BOILER EXPLOSIONS.

MESSRS. EDITORS:—I notice on page 196 of the present volume of the SCIENTIFIC AMERICAN an article on the above subject, signed by "T. A." He says that "the frequent displacement of water from one boiler to the other can be prevented by the following plan:—The further ends of the boilers from the fire should be connected near the bottom with a pipe for that express purpose," and adds, "this is a sure preventive of explosions from this cause." Last season, we constructed a cylinder boiler to be placed in the arch beside two others, which was 30 feet long and 30 inches in diameter, and under the back end of each, a short boiler was coupled, which was 8 feet long and 30 inches in diameter. The feed-pipe was attached to the front end of these short boilers or heaters entering the head. The steam-pipe connected all the boilers on top, and we found the water would not equalize, sometimes two of them being full, and the other empty. We then connected the long ones in front by a pipe attached to the lower end of the manhole. This we find to overcome the difficulty in part, but not entirely, and we shall yet connect them on the top of the forward end. Thus your correspondent can see we have connected these boilers in *three* places by *two* water passages and *one* steam, yet it does not accomplish the purpose. The bore of the pipe for the water connections is three inches, and steam-pipe bore 8½ inches, and none of these passages can possibly be closed up. We think a connection on top of the front end will remedy the difficulty by equalizing the pressure. I mention this to show that there are instances where T. A.'s plan will not accomplish the end sought. A. G. S.

Owego, N. Y., April 18, 1860.

A PROFITABLE WAY OF BURNING SAWDUST.

MESSRS. EDITORS:—Having noticed several communications in the present volume of the SCIENTIFIC AMERICAN with regard to furnaces for burning sawdust, and knowing it to be a subject of interest to mill-owners, I send you the following. I have had a great deal of experience in constructing such furnaces, and have never failed to construct them so as to burn sawdust of any kind; in many cases the dust being from timber taken from the water, and almost heavy enough to sink.

I never use a fire-front, which I consider an abomination, where a single boiler is used; the reason being as as follows:—1st, The conductor and front can never be kept sufficiently tight to insure a good draft, which is the great essential in burning sawdust. 2d, The conductor almost red hot and right in the fireman's face, together with the heat of the iron front, and the inconvenience of the doors, makes it almost impossible to give the fire the proper attention. 3d, With the front arrangement the ash-box doors are in front, and the fuel that may be spilled in filling is apt to catch fire, and has to be swept up at each time, and usually with as much fire as may be among it, which we may safely consider as the manner in which so many sawmills are burned; sawdust being the most treacherous fuel in this respect.

In setting-up single boilers for sawmills, I place the boiler in the stack; the stack being of the same width and a continuation of the furnace walls, the grates being laid across the boiler, the fuel doors being on one side of the furnace, and the ash-bed doors on the other. I use an air-tight slide damper in the stack to regulate the draft and amount of steam, so that the furnace can be kept always full of the fuel. Below I give the dimensions for a furnace for a common sawmill boiler with two flues, each 14 inches in diameter; the boiler being 20 feet in length and 36 in diameter. I hope these figures may prove of use to some of your numerous readers:—

Hight of chimney, 50 feet; width at base, 7 feet 9 inches; diameter of flue (square), 24 inches; thickness of furnace walls, 17 inches; clearance on sides of boiler, 4½ inches; area of fuel doors, 15x30 inches; area of ash-bed doors, 6 feet; area of grate surface, 16 feet; area of flue under the boiler, 8 feet; area of throat at the bridge wall, 3½ feet; clearance over the grates, 19 inches; clearance at back end of boiler, 20 inches.

I constructed (for the Ohio Tool Co., at this place) a furnace of proportionate dimensions upon this plan:—Boiler, 30½ feet in length and 48 inches diameter; thickness of walls (single), 22 inches. The result has been that, while, during March, 1859, they burned 10 bushels of coal daily, besides the cuttings and shavings from their workshops, during March, 1860, when doing the same amount of work of the same character, they have *sold* more than 15 cords of wood from their cuttings—worth $40. This saving is due to the improved construction of the furnace and greater draft, enabling them to burn green sawdust. The walls being very tight, the steam is found at a good pressure in the morning, and the wood that was formerly used to raise steam is now saved.

J. R.

Columbus, Ohio, April 16, 1860.

A CHEAP FISHING-NET MACHINE WANTED.

MESSRS. EDITORS:—The fisheries train a race of hardy men, who are the main support of our commerce in peace and defense in time of war; they also promote shipbuilding and give encouragement to almost every branch of agriculture and manufactures; consequently they are of the first national importance. Every invention therefore, that gives aid and encouragement to the fisherman, should be promoted, hence any machine that would facilitate the making of nets and seins (articles at present very expensive), would operate as a great benefit; but for this purpose the machine must be cheap, simple, and easily worked. I consider that such a

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one may be invented upon a similar principle to those for making lace and for knitting. Such a machine would undoubtedly have an extensive and rapid sale, I am told that there are large and expensive machines now used for making seins, but those are not calculated for the purpose, because they are not within the reach of the common fishermen. I reside at the side of a river abounding in fish, and if I could procure a small cheap machine of this kind, I should consider it a great boon, and there are hundreds in this place that would be glad to obtain similar contrivances.

I have taken the liberty of addressing you, as through your valuable paper, possibly some of the long list you weekly give of inventors may be induced to undertake to carry out the plan I propose.

R. G.

Sydney, Cape Breton, April 10, 1860.

[The small knitting machines manufactured by J. B. Aiken, office 429 Broadway, this city, and illustrated on page 328, Vol. XIV., (old series) of the SCIENTIFIC AMERICAN, could be so modified as to answer the purpose of making cheap nets. Of course they would not be so strong or durable as nets that are tied with a knot at the crossing of the meshes, but they would answer very well for most kinds of fishing.—EDS.

A WOMAN PLEADS FOR NEW INVENTIONS.

MESSRS. EDITORS:—Whatever lightens the labors and cares of the house helps to bring comfort and cheerfulness and elevated tastes to the heart of *home*. In a former letter, published on page 410, Vol. I. (new series) of the SCIENTIFIC AMERICAN, I suggested to practical artizans some improvements in the *kitchen stove*, and the kettles to be used thereon. I would further snggest that iron cooking kettles be lined with a material less easily oxydized. No dish of meat or vegetables can, with impunity, be allowed to cool in an iron vessel. Though iron is the most important of all metals in all the various uses to which it is applied—though it be a part of the soil, and a constituent of all plants, fruits and animals—though even the health of the blood depends on the quantity of iron which it contains, and this may yet be found to depend upon its magnetic properties, as one of the moving forces of that electro-magnetic machine, the human body—yet it does not follow that we should leave to ignorant or careless cooks the amount and quality of iron we are to consume, served up in unsavory dishes. Porcelain-lined kettles are all we could desire, but for their liability to crack off with dry heat. For instance, in cooking potatoes, my way is, either to peel or cut off a ring of peeling, and after boiling until the fork easily penetrates, but not till soft, drain off all the water, set the kettle back without the cover, to force the moisture in the potatoes to escape in the form of steam. My servant usually cooked the potatoes according to my instructions; but one day she unluckily used my porcelain fruit kettle for that purpose, and of course ruined it. If any kind of stone, or that peculiar clay used for vessels in glass manufactories, will stand dry heat, would be preferable to metal. If this is impracticable, could not a thin lining of silver or aluminum be brought within the reach of common use? If its influence upon health was properly considered, platinum itself would not be deemed too costly. A cooking kettle acts a most important part in the healthful and cleanly preparation of food. It is to be hoped that our our new silver mines will help us to silver tea-kettles, or, at least, to rid us of the copper bottoms.

In the letter above alluded-to, while speaking of a machine for *washing dishes*, I neglected to specify that the drainer should be placed in a water-tight box, with cover and faucet, and some churning machinery placed within, to splash the water. And in connection with this, we need some simple little apparatus for wringing out a cloth without wetting the hands.

I wish to call the attention of artizans to the *working dress* of females. The present working dress is a shame to the age of invention in which we live. I am aware of the conscientious efforts of many who have made martyrs of themselves, by trying to introduce a better style of dress for active life. Their experiments show a *want* in this direction. Women need a dress that will allow a full play of the chest, the free use of the arms, and the unconstrained action of all the blood vessels, nerves and muscles of the body. We want one of many pounds less weight, which shall not drag the body down or knock about the ankles at every step, and which will not "mop the house," from garret to cellar. The present working dress requires to be carried up stairs. No matter what else is to be carried, one hand is always monopolized by the dress. If any scrubbing or dirty work is to be done, the dress must be taken care of. Outside of the demands of health, buoyancy and cleanliness, *time* is too important to spend so much in taking care of the working dress, especially when servants' hire is such an item as it is in this country. Some sort of tunic and trowsers, made of warm material, forms a desideratum. Such a dress is also needed for out-door exercise, and for active life in general. Witness the calisthenic exercises of school-girls and mark the painful contortions of those in close waists, with arms tied down, when compared with the ease and grace of those in loose tunics. Is there not inventive power enough in the country to get up some shape or fashion of working dress which will better answer the purpose than the one in present use?

As the onward march of machinery is removing the drudgery from the various departments of labor and active life, the constitutions, habits, food and medicine of the people are also undergoing a corresponding change. For instance, the coarser vegetables are yielding place to those less bulky, and more nutritious. In this view, could not the *common chestnut*, being more palatable and nutritious, take the place of the potato? And could not the chestnut tree be dwarfed and brought forward, in the same manner as the apple and pear?

I would ask practical chemists whether the *fermentation of wine and cider* can or cannot be stopped at an early period, and before the juice becomes sufficiently alcoholic to be intoxicating? Such stoppage would afford a very healthful and delicious drink for the table and for general use, in place of the various foreign and deleterious drinks which are now poisoning the people. The successful discoverer in this department would indeed be a benefactor to his kind.

MRS. M. L. VARNEY.

San Francisco, Cal., March 31, 1860.

EGG-HATCHING MACHINE.

MESSRS. EDITORS:—Seeing in your paper of the 14th inst. an answer to W. B. O., of California, that you did not know where any machine to artificially hatch poultry could be obtained, I beg to say that I am the inventor of an egg-hatching machine, and I will warrant it to hatch the eggs of all kinds of birds, as well as all kinds of poultry; and the machine has a section in which to rear the same to maturity. Should your correspondent wish such a machine, he can be accommodated by W. J. Cantelo. Address, Box 194 Post-office, Philadelphia, Pa.

[We publish the above for the benefit of our California correspondent. We know nothing about Mr. Cantelo or his egg-hatcher; but we give the inventor's own statement respecting it.—EDS.

OF INTEREST TO NONE BUT INVENTORS.

While letters like the annexed may not interest that class of our readers who have never taken out patents, and who never expect to do so, there are many thousands of inventors who like to know the experience of others of their craft. To this class the following letters will afford much satisfaction:—

MESSRS. MUNN & Co.—Your polite note of the 2d inst. came to hand yesterday, bearing the news that my last application was granted. You may well imagine the enthusiasm that filled my heart at this result, for the anxiety I have had since the case was in your hands can only be realized by those in similar circumstances. I applied for a patent on my cultivator tooth, and on the hand corn-planter (patented the 6th of last month) nearly six months ago; both cases were *rejected*. The corn-planter I finally got through myself. The other case my judgment dictated (after the bad luck had been sadly experienced) should be confided to MUNN & Co. The case was energetically prosecuted by your successful agency, and it "passed the Rubicon." I can but again express my heartfelt thanks for your success; had the case been rejected my hopes and happiness would have been greatly blasted. H. B. HAMMON.

Bristolville, Ohio, April 7, 1860.

MESSRS. MUNN & Co.—Yours' of the 2d inst. has come to hand, and I hereby tender you my sincere thanks for the efficient and energetic manner in which you have carried my case through to a successful termination, and, when opportunity offers, I will take pleasure in recommending all having business at the Patent Office to employ you, is being safe and honorable men.

J. K. LEMON.

Toledo, Ohio, April 6, 1860.

MESSRS. MUNN & Co.—I feel truly grateful to you for the privilege of informing you that I am in receipt of my Letters Patent, which came to hand on the 10th inst. I was much pleased with their appearance. The drawings are so perfect that they hardly need explanation to enable a person to understand the working and construction of my machine. W. W. GREEN.

Chelsea, Ill., March 25, 1860.

MESSRS. MUNN & Co.—I am indeed under obligations to you for the promptitude with which you have conducted that business, and trust that your success in obtaining the patent will enable me ere long to show to you my gratitude for the kindness and indulgence you have on former occasions extended. W. BUSHWICK.

Easton, Pa., March 26, 1860.

MESSRS. MUNN & Co.—On March 26th I received a letter from you, stating that you had been successful in prosecuting the business I entrusted to your care. Yesterday I received the Letters Patent, which confirmed your statements. I was much pleased with the description and claims, and was satisfied that the originators are competent and experienced men. Please accept my thanks for your services in the prosecution of my case at the Patent Office, and be assured that if any of my friends have business to transact in your line, I will recommend them to you. G. K. BABCOCK.

Utica, N. Y., April 6, 1860.

MESSRS. MUNN & Co.—I have not before had an opportunity of expressing to you my sincere thanks for your prompt and upright way of transacting my patent business, and if I have any other business I will certainly solicit your aid. I have considerably simplified my lock, so as to make it applicable to banks and other places where safety is required. There is one thing in your system of obtaining patents that is alone worth (to an inventor) all your fees; and that is the explanation you give (in the weekly list of claims) at the end of each patent obtained by you. I am astonished at any one employing any other than yourselves; and such as do cannot be constant readers of your valuable paper—the SCIENTIFIC AMERICAN. C. DUCKWORTH.

North Adams, Mass., April 9, 1860.

MESSRS. MUNN & Co.—Yours' of the 10th inst. was received this morning; please accept my thanks for the information therein, and for the able manner in which you have prosecuted my claims before the Patent Office. Be assured that I shall use every laudable means to further the success of your agency and that of your indispensable paper—the SCIENTIFIC AMERICAN—which I consider should be in every mechanic's house. I have given to three apprentices the paper for one year, and I find, upon inquiry, that they have already improved by the perusal of it. S. DAGGETT, JR.

Charleston, S. C., March 18, 1860.

MESSRS. MUNN & Co.—Accept my sincere thanks for the promptness and efficiency with which you have conducted my case through the Patent Office. I had scarcely hoped to have heard from it before another month (at least) had passed, seeing the very many applicants that are constantly pressing their claims. I shall certainly recommend others to present their inventions through you. I have now under my eye a very poor man, of some sixty years, or more, who is struggling to get his application considered, but finds himself involved in constant trouble and difficulty. I have not failed to urge him to take the same course, not doubting that you will inform him faithfully whether his invention is as valuable as he supposes, whether it is patentable, and whether likely to clash with other patents. I shall now add the stimulus of your success in my case, and again urge him to confide his claim to you.

I remain yours, with sincere thanks,

S. CHAMBERLAINE.

Philadelphia, Pa., April 4, 1860.

MESSRS. MUNN & Co.—I have received the two patents issued the 10th inst., which makes three that I have received through your agency within the last four weeks. It is indeed gratifying to do business with business-men who understand their business and have the facilities in every department to accomplish what they undertake. Every case, thus far, which I placed in your charge has been successful. The one now before the Patent Office I trust will meet the same result, as also the one before the English office. Inventors should be doubly cautious in whom they trust their cases. Several years ago I lost one by bad management of an agent in Washington City. Your success has more than met my most sanguine expectations, and hereafter it will afford me the greatest pleasure to recommend you to all my friends and inventors generally. Respectfully yours,

J. E. EMERSON.

Trenton, N. J., April 16, 1860.

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LITTLE'S STAVE-CUTTER.

The value of flour exported from this country in 1858 was $19,328,884, requiring at least 4,000,000 of barrels, besides the millions that were demanded for the flour of our domestic consumption. When we add to this all the barrels necessary to contain our pork, beef, rice, sugar, meal, &c., we may form some faint idea of the immense number annually made, and of the value of improvements in this extensive industry. Our inventors seem to have just begun fully to realize the importance of this field of improvement, and we have no idea that they will ever let the matter rest unless a machine is produced which will take the growing tree, or at least the solid log, and turn it into a finished barrel, all hooped, with the head in, ready for market!

The machine which we here illustrate is intended for cutting or riving staves from the block. Two knives, A A, are attached to a revolving cylinder, within which cylinder the block, B, to be rived is placed upon the horizontal table, C. The outer end of the table, C, is supported by the frame of the machine, and the innner end by the shaft of the pulley, D. One end of the cylinder turns upon an axle of the usual form, the same one that carries the pulley, D; while the opposite end, in order to be open for the admission of the block, revolves upon the ring, E, which forms an annular or open journal. The tendency of the revolving knives being to push back the block, it is held in place by two dogs, F (Figs. 1 and 2), and these dogs are pushed forward to feed the block to the knives as it is cut away by an arrangement clearly shown in Fig. 2. Two pulleys, G G, are let into the table, and an endless cord, H, is carried over them and wrapped around the shaft, I. A crank, J Fig. 1) being secured to this shaft, the dogs, F, are moved back and forth by turning the crank; or the shaft may be turned by a pinion upon it connected with the machinery. Two knives, K K (Figs. 1 and 3), project inward in the cylinder for cutting off the ends of the staves.

Fig. 3

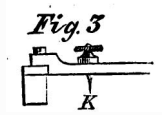
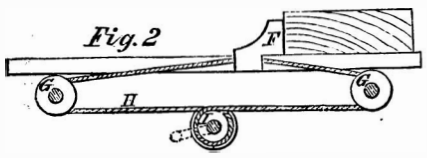
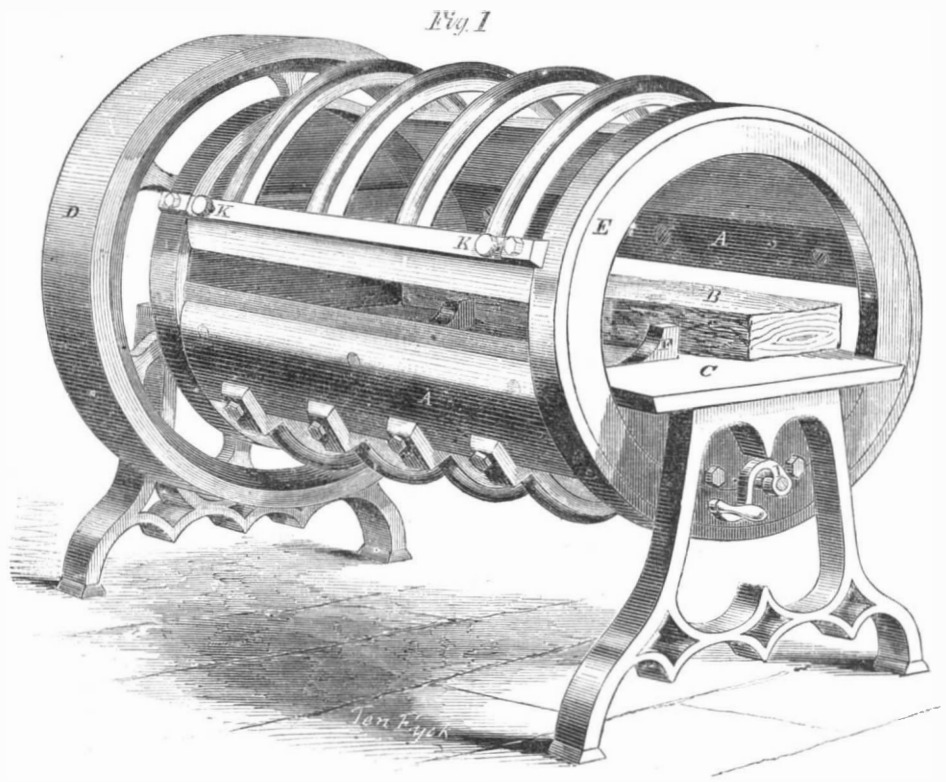


Fig. 2



The patent for this invention was procured (through the Scientific American Patent Agency) on March 8, 1859; and any one desiring further information in relation to it will please address James Little & Brothers, at Evansville, Ind.

Fig. 1

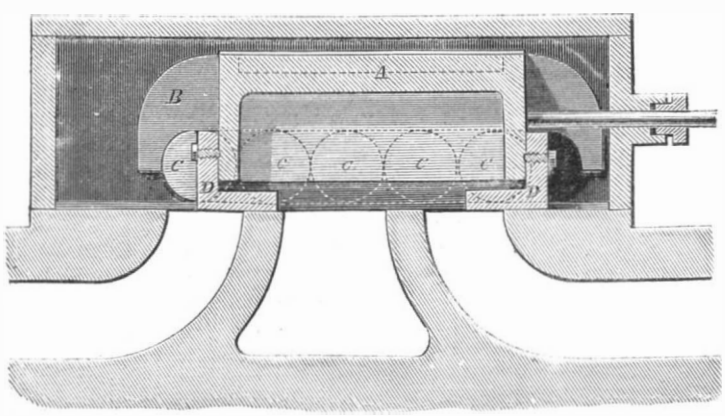


LITTLE'S IMPROVED STAVE-CUTTER.

A Rich Field for Inventors.—The last year's cotton crop of the United States amounted to 4,500.000 bales, which is just about a million of tuns, and as the weight of the seed is somewhat more than the weight of the fiber, there were not less than a million of tuns of cotton seed produced in this country last season. Now, this seed is full of valuable oil, which has always been wasted for want of some economical process for extracting it. The attention of inventors has recently been directed to the matter, and a beginning has been made towards working this vast mine of wealth. We see it stated that a company chartered by the last Legislature of Tennessee is about putting in operation, at Memphis, a factory for the extraction of oil from cotton seed, converting into the gold of commerce that which, but a few years ago, was a troublesome surplusage of the southern plantations. The present capacity of the works is 500 gallons per day. The processes of extracting and utilizing this oil are well worthy the attention of the thousands of ingenious minds which are scattered through the cotton States.

BRISTOL'S ANTI-FRICTION VALVE.

The pressure on the valve of a large locomotive amounts to some six or seven tuns, and each valve, in its sliding motion back and forth, is pushed, under this great load, more than 4 miles for every 100 miles traveled by the locomotive. Of course the friction on the face of the valve, notwithstanding the parts are polished very smooth and kept well lubricated, is very great, and much study has been devoted to devise some means of diminishing it. One of the most obvious plans is to place the valve upon wheels, and several modes of doing this have been proposed, but, for some reason, none have been extensively introduced.



BRISTOL'S ANTI-FRICTION VALVE.

The valve illustrated in the annexed cut is found to work satisfactorily, and is being rapidly introduced on the principal railroads in the country. It is already in operation on the New York Central, the Galena, and the Michigan Central roads, and arrangements are made for putting it into locomotives on the Reading and the Rock Island roads. It is also in highly successful use on several large propellers.

In this invention the valve is supported on rollers which travel freely on ways at each side of the valve. The top plate, A, of the valve projects at the ends, and rests upon two gibs, B B, between which gibs and the valve seat the rollers, C C C, are interposed, the gib and rollers, and the ways or track on which the rollers traverse being made of steel. The rollers are short and are guided by their contact with the valve on one of their ends or faces, and with the side of the steam chest on the other, while the gibs, B, are so constructed, as represented, that the series of rollers on each side are prevented from traversing too far in either direction.

The valve is made so that the pressure may at first come upon the valve face, in the ordinary manner, but as this is worn away the pressure is transferred to the rollers, which then come into play, thus preventing further wear of the face, but still allowing it to slide in steam-tight contact with the seat.

Large valves are cast in two pieces, the upper piece, A, fitting by a movable, but steam-tight, joint into the lower piece, D. The lower piece is allowed to take the pressure until it has worn itself perfectly tight upon the seat, when the set screws, *e e*, are tightened, and the pressure is brought upon the rollers. If, at any subsequent period, it should be apprehended that steam may soon leak through between the valve and its seat, the set screws, *e e*, are slackened and the lower or face piece, D, is allowed again to descend, to bear upon the face.

The patent for this invention was issued June 29, 1859. It has also been patented in Great Britain and France. R. C. Bristol, Esq., of Chicago, Ill., is the patentee, to whom all inquiries may be addressed.

RECENT EXTENSIONS OF PATENTS.

Hat-body Machinery.—In the year 1846, H. A. Wells, of this city, obtained a patent for an improved machine for manufacturing hat bodies. The patent was assigned to other parties, and it has proved to be, in the hands of the assignees, one of the most valuable inventions ever patented by our government. The inventor himself being dead, his widow lately applied, as administratrix, for an extension of the patent, which was granted by the Commissioner of Patents on the 16th inst. That our readers may have some idea of the enormous value of some patented inventions, we will state that it was proved on the above trial that the ascertained value of the invention to the public was $12,000,000. It was also proved that the inventor's receipts fell below his expenditures, and that the family of the inventor was poor, and wholly dependent upon the gratuitous payment to them of $1,200 per annum by the assignees of the patent. We have no doubt that this patent will be worth to its owners, for the next seven years, more than $150,000 annually.

Printing Telegraph.—The Commissioner of Patents has also extended the patent of Royal E. House, for a printing telegraph, for seven years, from the 18th inst. The application met with no opposition.

On the 11th of March, the British House of Commons, by a majority of 53, abolished the excise or internal tax upon paper. Thus, the great champions of ignorance in England—the nobility and the church—are being driven from one position after another by the increasing power and intelligence of the people.

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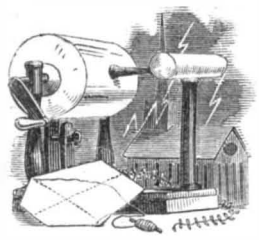
VOL. II., No. 18.....[NEW SERIES.]....*Fifteenth Year.*

NEW YORK, SATURDAY, APRIL 28, 1860.

ELECTRICAL CONDUCTORS.



HERE is something very fascinating in the study of electrical phenomena. This is doubtless owing to its mysterious nature—its imponderable character, irresistible power, and peculiar modes of operation. Most persons are deeply interested in it when it comes in the condition of atmospheric electricity, accompanying the rolling thunder, illuminating the darkness of night with its flashes, and sometimes shivering noble structures into fragments in an instant. As the season has now arrived when its destructive effects are frequently experienced in injury done to life and property, we take this opportunity of saying a few seasonable words on the subject, our attention having been principally directed to it by the letter of Judge Caton, published on another page. It is certainly a very desirable object to be enabled to obviate the dangers of lightning during those storms which are beyond man's control. We believe that Franklin made a discovery in the simple lightning-rod which can accomplish this object. There are many hundreds of instances on record which prove that these simple agencies, when carefully erected and of sufficient capacity, are perfect protectors against disruptive electric strokes. We cannot tell why it is that lightning prefers to travel quietly by one medium, such as metal conductors, and refuses to do so by others; we only know that such is the fact. It is by providing such conductors to carry atmospheric electricity from a charged thunder-cloud to the ground, that disruptive discharges which cause damage to buildings are prevented. The best conductor is silver, but copper is very nearly as good, and as it is much cheaper, it is very extensively used, especially on ships. In regard to the size of such conductors, it has been found that a rod of copper three-quarters of an inch in diameter or an equal quantity of copper under any form is capable of resisting the heating effects of any discharge of lightning yet recorded. Most of the common conductors, however, are made of iron, and these answer very well; but care should be exercised that they be of greater diameter for high than low structures, so as to lessen the resistance. A rod of iron three-fourths of an inch in diameter and perfectly united from top to bottom, is considered of sufficient capacity for any house from fifty to sixty feet in hight. If it rises ten feet above the roof, it is held to be sufficient for protecting an area extending forty feet from it in every direction. This point, however, is not fully settled. A lightning conductor should be carried down into the *moist* earth or a drain or well in every case, and be terminated with a plate of iron or copper, according to the metal employed. All the masses of metal near the conductor in a house should be united to it, so as to have a perfect connection of all the conducting agents. Some houses which have had lightning-rods secured to them have been shattered, but it is believed that there had been some imperfection in the metallic connections in all such cases.

Many persons have erroneously supposed that lightning rods attract the electric fluid, and that they are pointed for this object. We corrected this idea on pages 305 and 367, Vol. I. (new series) of the SCIENTIFIC AMERICAN, and in answer to these remarks we received a vast number of communications disputing our position. Since that period, an article in the *North British Review* (for last November), by Sir David Brewster, contains the following sentences:—"It will scarcely be credited that so late as 1838 the East India Company, on representation made to them by some of their officers, removed the lightning conductors from their powder magazines and other public buildings, on the ground that buildings with conductors were more frequently struck than those which had no such protection. Sir William Harris justly observes, in reference to this subject that 'conductors can no more be said to *attract* or *invite* a discharge of lightning than a water-course can be said to attract the water which flows through it at the time of heavy rain.'"

This is very high authority, and those who doubt the utility of such agents for protecting houses and ships from the destructive effects of lightning would do well to pay attention to one of the facts which Sir David Brewster adduces. He states that all the vessels in the British navy are now furnished with lightning conductors, and that during the past few years, while one hundred merchant ships have either been totally destroyed or severely injured by lightning, not a single ship of war has been materially damaged. As quite a number of our merchant vessels are either set on fire or otherwise injured by lightning every year, we hope our shipping merchants may now be induced from such evidence to furnish all their vessels with good conductors. The idea held by most persons that these agents attracted lightning has tended to prevent their more general application. Let all prejudices be banished from the minds of an intelligent people, and let science and correct observation exercise their just influence in the community.

INTERESTING FROM WASHINGTON – PATENT LAW DISCUSSION.

On Friday, the 14th inst., on motion of Mr. Bigler, the Senate took up the discussion of the Patent Bill, which was resumed on the following Monday, when several amendments were suggested. We think the bill would have passed but for want of a *quorum* of senators, many of whom were out of the chamber, attending to political matters. If our readers will turn to page 146 of the present volume, they will notice that the last clause of the second section of the Patent Bill provides that "hereafter no appeal shall be allowed from the decision of the Commissioner of Patents, except in cases pending prior to the passage of this act." In the discussion which took place on the bill, Mr. Bigler explained very clearly its principal features, and advocated their importance. Mr. Hale objected to the second section, and was unwilling to confine the inventors of the country to the Patent Office, as the only tribunal to which they could resort for the protection of the vast interests which come before the Commissioner, in reference to the granting of patents and the renewal or extension of the same. Senator Hale does not seem to understand that the applicant for the renewal of a patent has never had the right of appeal from the decision of the Commissioner of Patents; that officer is the sole arbiter in such cases, and his decision is final. Mr. Hale is also misinformed when he says that the Chief Justice was one of the board to whom such cases originally were referred. The board was originally composed of the Secretary of State, Solicitor of the Treasury and the Commissioner of Patents; but by the act of May 27, 1848, the whole jurisdiction in such cases was conferred upon the Commissioner, which jurisdiction had reference only to the power to extend patents. The Chief Justice had power to reverse the decisions of the Commissioner of Patents, and order a patent to be granted, upon appeals to him in all cases where the original application was rejected; also, to review and overrule the Office in cases of interference.

Mr. Trumbull (who is on the Patent Committee) replied, in answer to the objections of Mr. Hale, that inventors complained of too much *machinery* in the matter of issuing patents. He said:—"There must be an end to litigation somewhere; and it seems to me that these Primary Examiners first deciding, then the Examiners-in-chief, and then the Commissioner, give an applicant as many chances as the public good require he should have. I think it right to cut off the appeal to the courts. You can now appeal from three bodies of men—the Primary Examiners, the Examiners-in-chief and the Commissioner—to a court which cannot be expected to understand these matters as well as persons who devote their whole time and attention to them." In reference to this matter, Senator Trumbull's argument would be sound if the bill provided for a distinction between the decision of the Primary Examiner and the Commissioner. The decision of the former is technically the decision of the latter; for the Commissioner signs all the letters and decisions of the Examiners, and it looks odd, to say the least, to see an applicant paying to the Patent Office a fee of $20 to get the Commissioner to review and reverse his own decisions! During the past year, cases have come under our observation where the whole power of the Patent Office was exhausted in behalf of the applicant, and he was obliged to seek the aid of an outside appellant tribunal before he could overcome the obstinacy of the Patent Office. There is great force in Mr. Trumbull's suggestion, that the advantages of three impartial tribunals ought to secure the rights of every inventor, and is as much as the public good requires that he should have. We incline, however, to stick to the practice now prevailing in such cases, and leave open to all applicants the right to carry their claims out of the Patent Office for final adjudication, in case there are proper grounds for an appeal. The bill is generally right, and the reforms which it proposes are much needed; we hope, therefore, that the honorable senators will not kill it with amendments.

SMOKE!

The London *Engineer* administers to us the following lesson:—

"The SCIENTIFIC AMERICAN replies, in answer to a correspondent, 'Smoke consists principally of carbon. The plan of burning it by passing it into a hot furnace has been in operation for several years; it is extensively practiced in England. An escape flue is necessary.' Although smoke is rendered visible by the presence of carbon, in the most inconceivably minute state of subdivision, we had supposed that smoke consisted principally of carbonic acid, nitrogen and steam; and whatever plans may be in operation in England, or elsewhere, it may be taken as settled that smoke was never yet burnt by passing it into a hot furnace, nor can true *smoke*, once formed, be burnt at all. The carbo-hydrogenous brown vapor which is distilled from coal just thrown upon a fire, is very different from smoke, but not even this vapor can be burnt by passing it merely into a hot furnace."

Among all our exchanges, there is none for which we have a higher respect, and the coming of which is more heartily welcomed, than the *Engineer*. It is conducted and edited with marked enterprise and ability, and, as our readers are aware, we have enriched our pages by many valuable articles from its columns. We have derived satisfaction and profit from its teachings; but the above lesson, which is given expressly for our benefit, is contradicted by so many weighty authorities that we hesitate to accept it, even from the *Engineer*. We are told that smoke consists of carbonic acid, nitrogen and steam, but that it is rendered visible by carbon. That carbon may reflect light, and thus be visible itself, we have long since been taught; but the mode in which it makes another substance visible is a fact in optics which we should be pleased to have explained. If smoke consists of the substances named, it is certainly true that it "cannot be burnt at all," either by merely passing it into a furnace or by any other process known to science or art. It would be literally as impossible to consume it as it would to set the Thames river on fire. But we respectfully submit to our cotemporary that a definition of smoke which would render it absolutely incombustible, would prove that the learned, able and elaborate discussions of the subject of burning it, by the British people and Parliament, and in the columns of the scientific press—including the *Engineer*—were all conducted under an entire misapprehension of the nature of the substance.

The position that smoke cannot be consumed by *merely* passing it into a furnace is, in strict and literal meaning of the language, well taken. But as we not long since minntely discussed the phenomena of combustion, our readers are generally aware that it consists in the chemical combination of two separate substances, and that *one* cannot be burned merely by putting it into a furnace, or anywhere else, without bringing it in contact with another. The remark of the *Engineer* is just as true applied to cannel coal as to smoke; either of them can be burned only by receiving a proper supply of atmospheric air, or of oxygen in some form; but we do not deem it necessary to re-explain this matter whenever we allude to the subject in our condensed answers to correspondents.

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WEEKLY SUMMARY OF INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

MACHINERY FOR STAMPING METALLIC VESSELS.

This invention has for its object the stamping or forming out of a sheet of thin metal, such as tinned sheet iron, brass, copper &e., vessels of any desirable shape or size or description, so that they will be seamless. The invention is an improvement on the present process of "drawing down" or stamping vessels, such as oval, round, or square pans, very deep or very shallow, whereby the work can be all done at one and the same operation, and with one die acting upon the blank or blanks in a corresponding counter-die; the work may thus be accomplished with great rapidity, and with less liability of injury to the metal, than with the present slow method of sinking the metal at many separate and successive operations with different dies. This invention consists in the employment of suitable dies and counter-dies, corresponding in shape and size to the kind of work to be made, and in using with these, in a novel manner, a deviee which is brought down upon the blank so as to hold it with sufficient firmness on the counter-die bed to prevent it from *puckering* or *gathering* while the die is brought down and the metal forced into shape; at the same time this device does not hold the blank with such rigidity to prevent it from gradually drawing or slipping over the edge or margin of the counter-die, as the die descends into the counter-die, or the counter-die descends on the die, which would be the same thing; still it is preferable to fix the counterpart or intaglio of the die, to the bed or base of the stamping machine. It further consists in arranging a device which is termed the blank-holder so as work in suitably adjustible guides, and to be acted upon with a reciprocating action by a screw or other mechanical means, in such a manner, and in such a relation to the die, that said blank-holder will be the guide for this die, and conduct the same to the work, after the holder has been brought down and kept in a firm central position with respect to the counter-die, while it completes its operation of sinking or stamping. J. B. Jones, of Brooklyn (E. D)., N. Y., is the inventor.

MORTISING MACHINE.

The object of this invention and improvement in mortising machines is to throw into and out of place the mortising tool, and for reversing the movement of the same at any desirable moment, without shifting the belts or stopping the rotary motion of the auger to adjust the parts; at the same time to have the mortising tool advance or recede from the timber, instead of the timber to the tool. The invention consists in giving a rotary motion to the auger, and at the same time an alternate reciprocating movement to the chisel stock by means of a friction wheel and counter shaft which is hung at one end in a movable bearing arm operated by a suitable treadle so as to bring the periphery in contact with the main shaft, and to relieve it from said shatt at pleasure; and in conjunction therewith, is arranged a pinion bevel-gear wheel for rotating a cam shaft, for giving the advancing and receding motion to the mortising chisel, and for giving a simultaneous movement to the belt wheel on the main shaft. It also consists in arranging above the friction roller a counter roller, which receives its motion from the main shaft by a belt, or suitable gearing whereby the friction roller may be made to reverse its motion, and thus give an instantaneous receding movement to the auger and chisel. The patentee of this invention is Lovett Eames, of Kalamazoo, Mich.

SMOOTHING MACHINE.

The object of this invention is to obtain a machine by which doors, window sash, slate-frames, &c., &c., may be finished or smoothed off in a better manner than can be done by hand, and with great rapidity. The machine can be made so that it will accommodate itself to the varying thickness and sizes of work, and so that it may be worked by manual as well as steam or horse power. For this purpose the invention consists in arranging in a suitable relation with a system of feeding pressure rollers, a number of rotary disks which are placed in a horizontal plane, and have roughened surfaces suitable for smoothing the work passed over or in contact with their faces; the whole to be operated simultaneously and with a rapidity commensurate with that of the feed rollers. The inventor of this device is George Munger, of New Haven, Conn.

WIND WHEEL

This invention relates to an improvement in that class of wind wheels, which are commonly termed portable, and which are more especially designed for driving light machinery. The object of the within-described invention is to simplify and economize in the construction of such class of wind wheels, and at the same time render the same more efficient than hitherto. The invention consists in the employment of a deflecting cone, placed on the gearing, and so arranged relatively with the wheel that it may serve as a vane and keep the frame facing the wind; the cam serving the triple purpose of vane, cover or protector to the gearing, and deflector to cause the wind to act in the most efficient manner against the wind wheel. The credit of this contrivance is due to E. F. M. Fletcher, of Georgia Plains, Vt.

PLANING MACHINE.

The first part of this invention consists in a peculiar construction of cutter-head for the purpose of more effectually turning and breaking the shavings, the duty of the cap being performed by a portion of the cutter-head which is peculiarly formed for the purpose, and also in using with said cutter-head a bar to prevent the board from casually rising from its proper place. The second part of this invention consists in a peculiar form of clamp, by which boards with inclined ends may be instantaneously and securely dogged, or pieces of different lengths planed at the same time. This improvement was designed by Solomon S. Gray and S. A. Woods, of Boston, Mass.

VALVE.

The object of this invention is to obtain a larger area of opening in proportion to the size of the valve than is obtained with the valves in common use, thereby obviating in a great degree the difficulty of filling a large pump with a quick stroke; and to this end the invention consists in making a valve of two parts, the first being of annular or frame-like construction and fitted and operating in relation to the seat in the usual manner, and the second being made like a separate valve and fitted to a seat form around the opening of the first one. The inventor of this improvement is William Jeffers, of Pawtucket, R. I.

TENSION FOR SEWING MACHINES.

This invention consists in so applying, in combination with a friction apparatus for producing tension on the thread, a lever through or in contact with which the thread passes, on its way from said apparatus to the needle, in such a manner that the friction on the thread is in such degree counteracted by the draft of the thread on the lever, as to make the friction and consequent tension uniform or nearly so, notwithstanding variations in the size of the thread or other causes which would tend to vary the friction. The credit of this contrivance is due to Christopher G. Cross, of Chicago, Ill.

STUMP EXTRACTOR.

This invention consists in having two pawls fitted within a suspended rocking head, to which suitable levers are attached, the pawls being crossed and used in connection with a double-rack bar, which passes vertically through the head; the whole being so arranged that a good leverage power is obtained within a limited space, and an exceedingly simple, portable and efficient device obtained for the desired purpose. This device has been patented to C. Bates, of Kingston, Mass.

DISCOVERIES AND INVENTIONS ABROAD.

Purple Color from Quinine.—A patent has lately been taken out by C. H. Williams, of London, for obtaining a new coloring substance suitable for dyeing and calico-printing, from quinine, cinchonine, strychnine, or brucine. These substances are mixed with caustic alkali, and distilled, by which operation a liquid of an oily appearance passes over. This liquid is then re-distilled at a temperature of 320° and 350°, and it is divided into two substances, the one passing over at the lower, and the other at the higher temperature. The substance obtained at the highest heat is treated with an iodide or sulphate, to which are added water and ammonia in excess, when the mixture is boiled until the liquid assumes a deep purple color. When this liquid is afterwards applied to silk, it colors it a brilliant and permanent purple. The coloring matter is applied to the fabric in an alkaline solution, and as the coloring substance is not readily soluble in water, it is kept for constant use in alcohol. The portion of the distillate which has passed over at the lower heat is mixed with any alcohol radical compound, such as amyl, and is heated in a close vessel up to 250°, when water and the red oxyd of mercury are added; the mixture is then boiled, when the liqnid passes through the shades of blue and lilac, and finally becomes a deep purple. The brucine to be used for making this color may be obtained from coal tar, by distillation and subsequent purification by sulphuric acid and alkalies, and it is finally distilled again. The coloring matter obtained as described is always dissolved in alcohol before it is used for dyeing; the fabric is boiled in the solution. For calico-printing the extract is required to be considerably concentrated and mixed with albumen.

Chameleon Mineral.—The permanganates and manganates of potash and soda form this rare mineral, which is distinguished as a rapid oxydizing agent: When dissolved in water, it appears of a greenish hue at first, then it becomes purple, and subsequently a beautiful red. It is used for deodorizing, and, occasionally, as a medicine. Its chief use has been as an oxydizing substance; its extreme delicacy rendering it valuable in analytical chemistry. Hitherto it has been very high in price, and it could not be manufactured in large quantities. Quite recently, Mr. Wm. Wildsmith, analytical chemist, of Wolverhampton, has succeeded in manufacturing it upon a large scale, and at a price less than one-half of that at which it has hitherto been sold.

FOREIGN NEWS AND MARKETS.

North Atlantic Telegraph.—The "caution-money" of £20,000 on the concession of the North Atlantic Telegraph between Europe and the United States, for 100 years, granted by the Danish government, is stated to have recently been remitted to the Danish Minister of Finance at Copenhagen, by Messrs. Croskey & Co. The line will proceed from Scotland and Denmark, *via* the Faroe Islands, Iceland, Greenland and Labrador, to Canada and the United States; and its practicability is represented to have been recently demonstrated by a personal survey made by Colonel Shaffner, who, a short time since, gave evidence upon the subject before the House of Commons now sitting.

New Electrical Machine.—An electrical machine has been constructed in Paris, by an American, so powerful that it readily evolves electric sparks fifteen inches long. It charges an ordinary Leyden jar three times a minute, the discharge being as loud as the detonation of a musket. An observer writes:—"When the distance between the poles had been reduced to a single inch, producing an apparently continual electric current, I touched a cigar to the flame, literally igniting it by lightning. The experiments were conducted by Professor McCullough, of Columbia College, New York, and M. Foucault, of the Paris Observatory. It is probable that this machine, a triumph of American perfective industry, will be purchased by the French government for the Polytechnic Institute."

The Egg Trade in France.—A late number of Galignani's *Messenger* says that, in 1815, the number of eggs exported from France was 1,700,005; in 1816, it rose to 8,000,000. Six years later, in 1822, the number was 55,000,000; and 99,500,000 in 1824. In 1830, the number declined to 55,000,000; then gradually increased until 1845, when it was 88,200,000, for which an export duty of 114,000 francs was paid. Nearly all these eggs go to England. The yearly consumption of eggs in Paris is estimated at 165,000,000, and the total consumption of all France at 9,000,000,000; so that, reckoning eggs at a sou, this single article represents 465,000,000 francs.

Humanity of English Factories.—Fines amounting to nearly $5,000 were imposed upon English manufacturers during the six months ending October 31st; principally for employing children and women after 6 o'clock P. M.

Indian Cotton.—The exports from Bombay (India) to England, during the last year, were 623,605½ bales; being an increase over the preceeding year's exports of 268,352 bales. The exports to China, up to the end of 1859, were 161,916, which also shows an increase over the exports of 1858 of 59,872 bales. Thus, the total exports of cotton were 785,521½ bales, against 457,297 for 1858. Taking each bale at 380 lbs., and supposing (a low estimate) the price of Surat cotton at Liverpool to be 4d. a pound, this represents a cotton export trade of £5,000,000 sterling.

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INDUSTRY—MANUFACTURES—COMMERCE.

Ohio Wool.—It is claimed for Cleveland, Ohio, that it is the largest wool market in the West. The *Wool-grower*, which is devoted mainly to this interest, states that the amount shipped from Cleveland during the year ending Jan. 1, 1860, was 6,762,563 lbs., which embraces about one-half of the clip of Ohio. A large proportion of this amount was distributed directly to manufacturers in the New England States.

Richmond Coffee Trade.—Coffee forms a very prominent trade with Richmond, Va., and it has rapidly grown into importance. In 1853, the first cargo direct from Rio was received in that city, amounting to a few thousand pounds. Last year (1859) no less than 5,447,327 lbs. were received, valued at $559,220.

Sea Island Cotton.—Sixteen bales of Sea Island cotton raised on a plantation bordering Clear Creek, near the coast of Galveston Bay, Texas, were recently sold for 30 cents per pound in Galveston, which is referred to by the *News* of that city as another evidence of the adaptation of that climate for the successful growth of this valuable quality of cotton.

Canadian Commerce.—The total exports of Canada for 1859 were valued at $24,766,000; her imports at $33,555,000. Of this sum, $241,566 were obtained for ships built at Quebec and sold abroad.

California Brooms.---Making corn brooms has grown into a considerable business in San Francisco. It is conducted by three firms, which turn out, on an average, 800 dozen brooms per month, valued at $4 25 and $6 50 per dozen, according to quality, at wholesale. The California broom corn is reported to be stouter and more durable than that of the Atlantic States. Before this manufacture commenced in California, imported brooms sold as high as $7 a dozen. In another year it is expected they will be down to half that price.

The Copper Mines of Tennessee.—Remarking upon the operations of several mining companies in eastern Tennessee, one of which is reported to have produced copper to the value of $250,000 during the last seven months of 1859, the *Nashville Union and American* says: "This 'copper district' lies in Polk county, in the south-eastern part of this State, bordering upon the States of Georgia and North Carolina, and in the heart of the Cherokee Nation, and from the facts brought to light during the past few years, there appears no reason why these mines should not equal the Burra Burra mines of Australia, which have afforded such immense yields."

The Oil Wells.—A correspondent of the Erie (Pa.) *Gazette* states that among all the hundreds of wells which have been commenced in the oil region, not one has been abandoned as hopeless. The oil sites are usually leased, the owner receiving a certain proportion—from $\frac{1}{8}$ to $\frac{1}{3}$ of the fluid, and sometimes a bonus in money. The first part of the operation of sinking a well is to dig a shaft about 8 feet in diameter down to the rock, the distance varying from 10 to 40 feet. A wooden conductor made of plank, with a chamber of some five or six inches square, is then set down on the rock, reaching to the surface of the ground, when the work of boring is ready to commence. Some bore with a steam engine and some with a spring pole. The boring generally goes on at the rate of from two to six feet per day, and, to sink a shaft of four inches, probably costs about $2 per foot. After the rock is ground to sand beneath the drill, it is drawn up by means of a sand pump. The quantity of oil flowing from what is called "the Crosby well" is still held to be almost incredible, though the figures are not now held as high as they were in the first outbreak of the excitement. It is estimated that the well yields 60 barrels a day of 40 gallons each. Another yields nearly pure oil, the amount of water not exceeding one-tenth of the whole. A stream of pure and transparent fluid, far superior to the ordinary petroleum, flows incessantly into a mammoth oil vat, whose capacity is 8,000 gallons, and which yields 25 barrels a day.

Construction of Omnibuses.—A correspondent of the *Evening Post* suggests an improvement in stages and such vehicles, by lowering their bodies and bringing them down to about the same level as the street railroad cars. This can be easily done by bending their hind axles, and it would certainly be a convenient improvement for passengers.

THE RISE AND PROGRESS OF INVENTIONS.

ADVICE TO INVENTORS.

During the period of Fourteen Years which has elapsed since the business of procuring patents for inventors was commenced by MUNN & Co., in connection with the publication of this paper, the number of applications for patents in this country and abroad has yearly increased until the number of patents issued at the United States Patent Office last year (1859) amounted to 4,538; while the number granted in the year 1845—fourteen years ago—numbered 502—only about one-third as many as were granted to our own clients last year; there being patented, through the Scientific American Patent Agency, 1,440 during the year 1859. The increasing activity among inventors has largely augmented the number of agencies for transacting such business; and at this time there is scarcely a town of 4,000 inhabitants, but has its patent agent, patent lawyer, patent solicitor, or patent attorney, all of which terms are used to convey the same idea—viz., that their services are offered to the inventor or patentee for a pecuniary consideration.

In this profession, the publishers of this paper have become identified with the universal brotherhood of Inventors and Patentees at home and abroad, at the North and the South; and with the increased activity of these men of genius we have kept apace up to this time, when we find ourselves transacting a larger business in this profession than any other firm in the world. Year after year, we have increased our facilities for transacting patent business, by gathering around us a large corps of the most eminent engineers, draughtsmen and specification writers that can be procured. Among these gentlemen are those who have been connected with the United States and Foreign Patent Offices. The latest engagement we have made is the association with us of **Hon. Charles Mason**, formerly COMMISSIONER OF PATENTS, and favorably known to the Inventor as their friend and advocate. The memory of his acts while holding this high position will be cherished by many an honest inventor with gratitude as long as he lives.

The arrangement made with Judge MASON renders our facilities for prosecuting all kinds of patent business complete, however ample they were before; and without being accused of egotism, we may safely assert that no concern has the combined talent and facilities that we possess for preparing carefully and correctly applications for patents, and attending to all business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c.

FREE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable are advised to make a sketch or model of their invention, and submit to us, with a full description, for advice. The points of novelty are carefully examined, and a reply written corresponding with the facts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh streets, Washington, by experienced and competent persons, under the direction of a gentleman who has spent a lifetime about the Patent Office. Over 1,500 of these examinations were made last year through this office, and as a measure of prudence and economy, we usually advise inventors to have a preliminary examination made. Address MUNN & CO., No. 37 Park-row, New York.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared on reasonable terms, by sending a sketch and description of the invention. The government fee for a caveat is $20. A pamphlet of advice regarding applications for patents and caveats furnished gratis on application by mail. Address MUNN & CO., No. 37 Park-row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention, if susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition is composed for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the government fee, by express. The express charges should be prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park-row, New York.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, enclosing the official letters, &c.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through our Agency the requirements of the different Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park-row, New York, or either of our branch offices.

INTERFERENCES.

We offer our services to examine witnesses in cases of interference, to prepare arguments, and appear before the Commissioner of Patents, or in the United States Court, as counsel in conducting interferences or appeals.

For further information, send for a copy of "Hints to Inventors." Furnished free. Address MUNN & CO., No. 37 Park-row, New York.

THE VALIDITY OF PATENTS.

Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Many persons have been ruined from adopting the "penny-wise and pound-foolish" maxim, when an investment of a few dollars, to have been informed of their rights, would have saved them much anxiety and money. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. Judge MASON assists in all examinations of this kind.

For further particulars, address MUNN & CO., No. 37 Park-row, New York.

EXTENSIONS OF PATENTS.

Valuable patents are annually expiring, which might be extended, and bring fortunes to the households of many a poor inventor or his family. During the past fourteen years, we have had much experience in procuring the extension of patents; and, as an evidence of our success in this department, we would state that, in all our immense practice, we never lost but two cases—and those were unsuccessful from causes entirely beyond our control.

It is important that extension cases should be managed by attorneys of the utmost skill to ensure success. All documents connected with extensions require to be carefully drawn up, as any discrepancy or untruth exhibited in the papers is very liable to defeat the application.

Of all business connected with patents, it is most important that extensions should be intrusted only to those who have had long experience, and understand the kind of evidence to be furnished the Patent Office, and the manner of presenting it. The heirs of a deceased patentee may apply for an extension. Parties should arrange for application for an extension at least six months before the expiration of the patent.

For further information, as to terms and mode of proceedure in obtaining an extension, address MUNN & CO., No. 37 Park-row New York.

ASSIGNMENT OF PATENTS.

The assignment of patents and agreements, between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park-row, New York.

PATENT CLAIMS.

Persons desiring the claims of any invention which has been patented within 14 years can obtain a copy by addressing a note to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying. Address MUNN & CO., No. 37 Park-row, New York.

CAUTION TO INVENTORS.

Messrs. MUNN & CO. wish it to be distinctly understood that they neither buy nor sell patents. They regard it as inconsistent with a proper management of the interests and claims of inventors, to participate in the least apparent speculation in the rights of patentees. They would also advise patentees to be extremely cautious into whose hands they entrust the power to dispose of their inventions. Nearly fifteen years' observation has convinced us that that the selling of patents cannot be conducted by the same parties who solicit them for others, without causing distrust.

BUSINESS CONDUCTED CONFIDENTIALLY.

We would inform inventors that their communications are treated with the utmost confidence, and that the secrets of inventors confided to us are never divulged, without an order from the inventor or his acknowledged representative.

TESTIMONIALS.

The annexed letters from the last three Commissioners of Patents we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

Messrs.. MUNN & Co.—Gentlemen: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

MODELS BY EXPRESS.

Inventors sending models to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies, either through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them!

It would require many columns to detail all the ways in which the inventor or patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, 37 Park-row, New York, where any questions regarding the rights of patentees will be cheerfully answered. Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park-row, New York.

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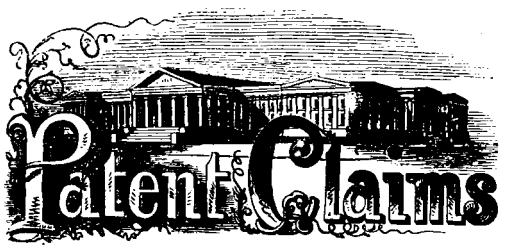

ISSUED FROM THE UNITED STATES PATENT OFFICE
FOR THE WEEK ENDING APRIL 17, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

27,877.—S. M. Allen, of Niagara Falls., N. Y., for an Improvement in the Manufacture of Thread and Yarn:

I claim the new article of manufacture—the same consisting in thread and yarn, made by combining ordinary short-stapled fibrous materials like cotton or wool, with a short fiber prepared from long stapled fibrous materials, like flax, hemp, jute, silk, china, glass, and similar substances, by both the described mechanical reduction and chemical treatment referred to, so that when so combined they can be spun on the ordinary cotton and woolen machinery.

27,878.—S. M. Allen, of Niagara Falls, N. Y., for an Improvement in the Method of Reducing Long Staple Fibrous Materials:

I claim the method described of preparing long-stapled vegetable fibrous material, for the purpose of spinning therefrom both coarse and fine yarn or thread, by combining the described mechanical reduction of the said fiber, with its chemical treatment, as set forth.

27,879.—Caleb Bates, of Kingston, Mass., for an Improvement in Stump Extractors:

I claim the employment of the crossed pawls, E F, in combination with the rack bar, G, head, B, and levers, C C, as and for the purpose shown and described.

I also claim the arrangement of the pivots or pins, on which the pawls, E F, turn, above the plane of the bearing edges of the trunnions, g g, so that the fulcra of the lifting levers will shorten as the levers descend, and the lifting power will be correspondingly increased.

I further claim the employment of the knife-edged trunnions, g g, in combination with the head, B, and pendulous rods, e e, as and for the purpose shown and described.

27,880.—T. H. Bell, of Washington, D. C., for an Improvement in Hanging Bells:

I claim constructing and combining the several parts of the apparatus, substantially as before described, so as to admit of the "pull wire" running off in any desired direction.

27,881.—Wm. A. Bird, of Newark, N. J., for an Improvement in Sliding Carriage Seats:

I claim the steady pins, be they more or less than two, and the eye-pieces, when constructed, arranged, and operated substantially in the manner and for the purpose set forth.

Also, the irons, V and W, when used in connection with the steady pins, to insure the firmness of the seat.

27,882.—E. W. Blake, of New Haven, Conn., for an Improvement in Machines for Breaking Stones:

I claim, first, Constructing and supporting the fixed jaw of the said machine for breaking stones, in such manner that it can be inverted when worn, and confining it to its place by the check pieces, as described.

Second, Transferring the point of support and motion of the movable jaw from below to above its acting face, as described.

Third. The employment of the toggle block and wedge, as described, for the more convenient and precise adjustment of the size of the opening which determines the size of the fragments.

27,883.—Wilson Bohannan, of Baltimore, Md., for an Improved Padlock:

I claim arranging the bolt, C′, on top of the bolt, C, and pivoting the two together by means of a pivot, a, and controlling the operation of the same, by means of the two guide stops, D D′, and two springs, F′ F′, in the manner and for the purpose described.

27,884.—S. D. Bowker, of Geneva, Ohio, for an Improvement in Self-detaching Whiffle-trees:

I claim, first, The peculiar lever, L, in combination with the ring, G, and the spring, F, attached to the cylindrical box, D, the said lever being provided with a raised part, O, and tongue, N, and said ring with notches, H and I, and slant or trimmed portion, K, as described and operating as and for the purposes set forth.

Second, I claim the employment of the hollow cylindrical box, D, for holding and sustaining the bar or body of the whiffle-tree, so that it is free to turn therein; also, the mode of attaching the whiffle-tree to the double tree, or the draw bar of the thills, by means of the shank, E, and screw nut, for the purpose of maintaining its ordinary horizontal movement, as described.

27,885.—R. P. Boyce, of Erata, Miss., for an Improved Currying and Leather-dressing Machine:

I claim the rotating cylinder A, and pressure roller, P, or its equivalent, in connection with the reciprocating frame, K, provided with the currying knife, M, stone, N, and brush, O, arranged for joint operation, as and for the purpose set forth.

27,886.—T. F. Card, of Cincinnati, Ohio, for an Improvement in Fire-places:

I claim the arrangement of the center plate, c, side plates, c′c″, slots, e pins, f, supporting rods. b, and pins, hooks, or staples, a, and d, the whole being constructed and combined in the manner set forth to form a movable and adjustable deflecting plate adapted to be applied at any hight to a fire-place of any dimensions.

27,887.—J. M. Clark, of Philadelphia, Pa., for an Improvement in the Bleaching of Grain by Sulphurous Acid:

I claim the bleaching of wheat and rye, by exposing the same to the action of sulphuric acidgas, substantially as set forth.

27,888.—E. S. Collins, of Aspen Wall, Va., for an Improvement in Tobacco Presses:

I claim the arrangement of the lever, F, the adjustable sword, L, the arm, R, and the cords, J K, with the wheels, G H I, and the sliding journal box, O, when the same are connected together, operated and used, substantially as and for the purpose specified.

28,889.—Hezekiah Conant, of Willimantic, Conn., for an Improvement in Looms:

I claim the combination of a whip roll of a loom with a belt guide, so that a belt may be shifted, and the relative speed of a pair of cone pulleys may be made to differ as and whenever said roll is depressed, as set forth.

27,890.—George Coombs, of West Falls, N. Y., for an Improved Mangle:

I claim the combination and arrangement of the weighted box, c, windlass F, smoothing table, B, and rollers, G, with the frame, A, for the purposes and substantially as described.

27,891.—Louis Daser, of Washington, D. C., for an Improved Sextant:

I claim, first, The combination of a spring click and micrometer wheel with the tangent screw of a sextant, substantially as and for the purpose set forth.

Second, The combination with the tangent screw of a sectant, of the stop nut, s, for the purpose explained.

27,892.—T. B. DeForest, of New York City, assignor to himself and Wallace & Sons, of Ansonia, Conn., for an Improvement in Lanterns:

I claim the combination of the fastening springs, S, and the encircling band, B, with the lamp of a lantern, when said lamp and encircling band, or either of them, have depressions, or their equivalents, formed in their surfaces, substantially as described and for the purposes specified.

27,893.—David Donald, of New York City, for an Improved Machine for Cutting Veneers:

I claim, first, Combining with a laterally sliding knife stock, C, a toothed segmental arm, I, and a toothed sliding rack, J, substantially in the manner and for the purpose described.

Second, The arrangement of laterally adjustable guide grooves, i, and vibrating arms, S, in combination with the reciprocating log carrier, L, constructed and operating substantially as and for the purpose set forth.

[An engraving and full description of this invention will appear in a few weeks.]

27,894.—S. P. Dunham and A. Hipple, of Kilbourne, Ohio, for an Improved Churn:

We claim the combination of the hollows, c, of the side pieces of the outer dasher, with the webs, a, attached to the inner wall of the vessel, A′, together with the combinations of the hollows, a, of the side pieces of the inner dasher, with the webs, b, attached to the side pieces of the outer dasher, when these combinations are made and arranged as and for the purposes specified.

27,895.—Lovett Eames, of Kalamazoo, Mich., for an Improved Mortising Machine:

I claim first, Giving a forward and reverse movement to the chisel and auger by cam, G′, when the same receives its motion from the main shaft, B, and a drum, S, through the medium of friction wheel, N, on a counter shaft, having one end under control of the operator, so that said wheel may be forcibly brought into contact with either the drum or shaft, by a rocking movement of the foot lever, at the option of the attendant, essentially as described and represented.

Second, I claim giving a simultaneous reciprocating movement to belt wheel, C, to that of the auger and chisel stock, E D, by means of the duplicate cam, G2 bar L, and yoke. h, or their equivalents, for the purposes and substantially as set forth.

27,896.—Wm. M. Ellis and J. B. Ellis, of Washington, D. C., for an Improvement in Casting Fire-plugs:

We claim preventing the heat of the molten metal from injuring the brass or other metal, which is to form the lining or seat surface for the plug or valve, by the use of the block, d, or its equivalent, as set forth.

27,897.—J. R. Ender, of Trenton, La., for an Improvement in Hats:

I claim a hat provided with a lining of lampblack, charcoal, or other equivalent non-conducting substance, as shown and described.

[The object of this invention is to provide for a hat that protects the head in the hottest summer day, as well as in winter time, and it consists in arranging in the crown of the hat a stratum of charcoal dust or lampblack of sufficient thickness to exclude the heat of the sun, while the small specific gravity of these materials do not increase the weight of the hat sufficiently so as to make it inconvenient for the wearer.]

27,898.—Isaac P. Frink, of Newark, N. J., for an Improved Reflector for Gas-lights:

I claim the arrangement of a rectangular pyramidal reflector, A, with beads, b b′, near the upper and lower edges, in combination with a curved cover, B, and with a hinged adjustable section, C, constructed and operating substantially in the manner and for the purpose specified.

[This invention consists in combining with a rectangular truncated pyramidal reflector, a curved cover of such a form and at such a distance from the top of the reflector that all the rays of light thrown upwards through the opening in the top of the reflector are turned back by the cover through said opening. The sides of the reflector are strengthened and ornamented by beads, which also serve to catch such rays as would otherwise escape over the edges of the reflector without any useful effect; and a hinged section is secured to one of the sides of the reflectors, whereby the rays of light can be concentrated more or less on any given point.]

27,899.—F. F. Fowler, of Crane township, Ohio, for an Improvement in Elevators for Hay, &c.:

I claim the revolving crossbar, D, constructed as described, with its adjustable arms, a, and pulleys, P, in combination with shaft, S, platform, A, fork, F, ropes, c, and c′, and pulley, P′, operating substantially as and for the purposes set forth.

27,900.—Theodore Grundmann, of Freeport, Ill., for an Improvement in Machine for Crushing Sugar Cane:

I claim the arrangement and combination for the purpose specified of the drum or cylinder, D, pressure rollers, E, provided with the feed and discharge spouts, G H, and the receiver, I, substantially as set forth.

[The object of this invention is to obtain a simple, compact, and efficient cane-crushing machine, one that can be attended with but few hands, and have a great working capacity. The invention consists in the employment or use of a large central cylinder or drum in connection with a series of pressure cylinders, whereby the desired end is attained.]

27,901.—Martin Hallenbeck, of Albany, N. Y., for an Improvement in Harvesting Machines:

I claim the arrangement of the bent or crank-shaped axle, C′, to vibrate substantially as described, to release and connect the gearing, as described.

I claim the construction and arrangement of the tongue and main frame, in combination with the shank of the finger bar, hinged to the finger bar and main frame, in the manner and for the purpose specified.

27,902.—James Hare, Jr., of Paterson, N. J., for an Improved Oil Cock:

I claim the arrangement of the nut, D′, in combination with the movable plug, A, and with the stationary globe, B, constructed and operating substantially as and for the purpose specified.

[The object of this invention is to produce a cheap and effective lubricator for steam cylinders and similar devices, and the invention consists in the arrangement of an oil cap, in which the plug is always kept perfectly tight by means of a nut which screws down over the end of the plug, whereby the oil cup is kept perfectly tight and easily adjusted.]

27,903.—G. W. L. Hazen, of Indianapolis, Ind., for an Improvement in Sugar Mills:

I claim the frame, H I and G, when constructed and held in place by the hoops or bands, E E, or their equivalents, substantially in the manner and for the purposes set forth.

27,904.—L. Hermance, of Saratoga Springs, N. Y., for an Improved Beer Pitcher:

I claim the combination of valves, C D, with a pitcher, when arranged in the manner and for the purposes described.

[This invention consists in arranging at the base of the spout of the pitcher, a valve, which is acted upon by a spring for keeping it down tightly in its seat, and in connecting with this valve a suitable lever, which passes around the outside of the pitcher top, is pivoted to each side of the same, and connects with a second valve which closes a vent hole in the pitcher top, the whole being arranged so as to be operated simultaneously by the pressure of the thumb of the hand holding the pitcher.]

27,905.—Cornelius Hood, of Seneca Falls, N. Y., for an Improvement in Pumps:

I claim the arrangement and combination of the hollow piston, H, with the internal short cylinder, G, and external cylinder, D, valves, g b, and annular valve, d, to form a continuous-acting pump, substantially as and for the purposes set forth.

27,906.—J. L. Howard, of Hartford, Conn., for an Improved Coupling Attachment for Cords, Ropes, &c.:

I claim the employment of the tubes, A, in combination with the rope or belt and the socket, C, substantially as and for the purposes shown and described.

[The object of this invention is to obtain a simple and efficient means for connecting together the ends of ropes, cords or round belts, and also for attaching the same to any fixture. The invention consists in the employment or use of a divided screw or corrugated conical tube, which embraces the end of the rope, cord or belt, and is fitted within a conical socket to effect the desired end.]

27,907.—Stephen Hughes, of Hamilton, Ohio, for an Improvement in Flour Separators:

I claim, 1st, The construction of the beater with shoulders, E, and eccentric surfaces, F, for the purposes set forth.

Second, The adjustable chute boards, H, constructed and arranged and operating in the manner and for the purposes set forth.

27,908.—J. M. Jay and J. Danner, of Canton, Ohio, for an Improved Egg-beater:

We claim the combination of the beating device, represented by letters B C and D, in combination with the case, I, substantially as and for the purposes set forth.

27,909.—Wm. Jeffers, of Pawtucket, R. I., for an Improvement in Pump Valves:

I claim the combination of the two valves, B C, with each other and with the seat, A, and the hinges, a a, as and for the purpose shown and described.

27,910.—R. W. Jenks, Jr., and F. A. Steere, of Providence, R. I., for an Improvement in Brakes for City Railroad Cars:

We claim the combination with spring, G, working in a suitable slide box, of the pawl bar, H, brake bar, J, with its shoe, K, the ratchet wheel, D, and brake wheel, E, and the sliding clutch arm, M, with its pin, g, passing through the shoe, K, the whole arranged, operating and operated by a lever, N, substantially as and for the purposes set forth.

We further claim the lever, c, arranged as set forth, and operated by the draught rod, d, in conjunction with the brake bar, J, for the purposes specified.

[This invention consists in the arrangement of an elliptic spring, or a spring of any suitable description, in such a relation to the brakes that are made to operate upon a cylindrical drum wheel fixed to the axles, that, by the combination of a clutch attachment and ratchet wheel, the driver may apply the brakes at any moment to said drum, which will cause either axle of the car wheel to act against the spring and compress it, after which the spring will exert a powerful force to further retard the motion of the car by the friction of the brakes on the drum wheel alone. The same force, viz., that of the spring, will give a forward impulse to the car when the brakes are relieved. The application of the brakes will be made by the driver by a simple movement of his hand, and their release will be effected by the draught of the horses in starting off. Very little power will be requisite in either instance.]

27,911.—J. B. Jones, of Brooklyn (E. D.), N. Y., for an Improved Machine for Forming Vessels of Sheet Metal:

I claim, first, The employment of a blank holder, D, or its equivalent, arranged in such a relation to the die and counter die, and operated in conjunction therewith, that the blank of which the pan is to be formed will be held down on the counter die and prevented from crimping while the die is carrying the blank down, essentially in the manner and for the purpose set forth.

Second, I claim the clutch, M, arranged and combined with the die screw shaft, H, in combination with clutch plate, G, of shaft, F′, and gage screws, e e e, for the purpose of causing the die and die-holder to descend together until the former comes in contact with the blank on the counter die, when the die will descend alone the required distance.

27,912.—Henry Johnson, of Washington, D. C., for an Improvement in Vapor Lamps:

I claim, first, The pipe, B, when used as a fluid pipe and generator or vaporizer, and also when used as a gas pipe in connection with nib, C, for the conveyance of fluid from the supply pipe for generating or vaporizing, and for conveyance of gas or vapor to the burner.

Second, The combination of the two regulating set screws or keys, G and F, operating substantially as set forth and for the purposes described.

27,913.—B. J. Lane, of South Framingham, Mass., for an Improvement in Shoemaker's Awls:

I claim the combination of the projection or shoulder, c, nut b, and slotted screw cone, a, substantially as described, whereby the projection or shoulder, c, is made to perform the function of driving the pegs, and also serve as a means to facilitate the screwing-up of the nut, and consequently, the securing of the awl to the handle, substantially as described.

27,914.—Daniel Lee, of Boston, Mass., for an Improved Steam Trap:

I claim my improved steam trap-expander, as made tubular or hollow, and with one or more lateral openings, e.

I also claim my improved mode of arranging or combining the tubular-expander with its valve and case, viz., by having the expander at or near one of it fastened to and opening through one end of the case, while, at its other end, it is connected with the valve, C.

I also claim making the valve, C, separate from the expander, and applying the two together by adjusting screws, B C, as described.

27,915.—C. T. Liernur, of Mobile, Ala., for an Improvement in Testing the Wear of Railroad Rails and Wheels:

I claim a railroad car revolving by means of a center shaft, and supported by 4, 8, or more wheels, the axles of all of which point towards said shaft, and running said car upon a circular track of railroad rails, for the purpose of submitting both rails and wheels to a test of actual usage, substantially as and for the reasons described.

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27,916.—Loomis Mann, of Ionia, Mich., for an Improved Machine for Making Eave Troughs:

I claim, first, The wing or bed-piece, B, and clamping plate, C, rigidly attached to the roller, H, forming a lever thereto, operating in combination with the movable bar, D, in the manner and for the purposes set forth.

Second, I claim notching the edges of the bar, D, and clamping plate, C, where they cross the lap of the plates, to admit of their being soldered from edge to edge whilst in the machine, substantially as specified.

27,917.—T. H. McCulloch, of Peoria, Ill., for an Improvement in Grain-drying Machines:

I claim the tubes, C, conical chamber, D, and hollow plugged shaft, B, placed within a rotating slightly-inclined cylinder or shell, A, and arranged to form steam or hot air passages, g E h, to heat the chamber, D, and tubes, C, substantially as and for the purpose set forth.

I further claim the arrangement of the plate, I, connecting two tubes, C, to form a water-lifting chamber, j, and the tube, l, to form a communication between said chamber, j, and the shaft, B, as and for the purpose specified.

[This invention consists in the employment or use of a series of tubes and a conical chamber placed within a rotating inclined shell, whereby the article or substance to be dried or acted upon by heat is, within a limited space and consequently by a very compact device, subjected to a great heating surface, and the desired work efficiently and expeditiously performed.]

27,918.—W. S. McEwen and N. A. Patterson, of Kingston, Tenn., for an Improvement in Overshoes and Boots and Shoes:

We claim a tube, C, formed around the edge of the mouth of a shoe having a corrugated inside surface, the corrugations communicating with said tube, substantially as and for the purposes set forth.

[This invention consists in combining with a shoe, grooved, corrugated or ribbed on its inner surface, a suitable covering or shield for the edges of the mouth of the shoe, for the purpose of preventing water, dust, &c., from falling or working down the grooves of the quarters and vamp from the mouth of the shoe; the same to be made of any suitable material and cemented, stitched or attached round the mouth of the shoe in any convenient manner.]

27,919.—J. H. McGehee, of Athens, Ala., for an Improvement in Grain Separators:

I claim, first, Arranging a pivoted self-adjusting float or board across the lower end of the second sieve, so that the wheat, in passing off of said sieve, shall be evenly spread before it enters the separating flue, and in case the feed be rapid, the escape shall be commensurate therewith, substantially as and for the purposes set forth.

Second, Beveling the slats of the flue from their inner edge to within about one-third of their rear edge, and hanging them out of center on pivots, substantially as and for the purposes set forth.

27,920.—J. V. Merrick, of Philadelphia, Pa., for an Improvement in Steam Carriages:

I claim, first, The use of a surface condenser immersed in water, when the water used for such surface condenser is cooled, or partially cooled, by the passage of currents of air, in the manner set forth.

Second, The combination of the boiler and engines with surface condenser and cooling apparatus, when constructed, arranged and operated substantially as described, for the purpose of propelling carriages by steam, substantially as set forth.

27,921.—Azel Reynolds, Jr., of North Bridgewater, Mass., for an Improved Staging-supporter for Mechanics' Use:

I claim so arranging the two sets of struts of the staging-supporter, that one set may directly bear or sustain the sliding bracket while the other supports the post, as described.

I also claim arranging the two brackets and posts and combining them together, substantially as represented in Fig. 4, and as above described.

I also claim combining with each post an adjustable socket, carrying ear-pieces or bearers for the reception of the struts, as described.

I also claim combining a lateral rest, b, with each bracket, the same being to support the bracket laterally against a wall or another such rest.

27,922.—James Montgomery, of Baltimore, Md., for an Improvement in Steam Boilers:

I claim combining with a boiler which has a series of horizontal flues or tubes, or a boiler of any form other than that specified in my above-mentioned Letters Patent, but which has the flue space or passage leading from the fire chamber to the tubes or flues at one end of the said chamber, a grate of the whole or nearly the whole length of the boiler, with one or more fire-doors at each end, substantially as and for the purpose set forth.

27,923.—James Moore and Archibald Kelly, of Pittsburgh, Pa., for an Improved Machine for Making Picket Fence:

We claim, first, The arrangement of the wheels, 31 and u, cam, m, cam yoke, n, operating and regulating stops, j, section of wheel, q, and wheels, r s and t, in combination with the reels, v, springs, w, and twisters, I, as described and for the purposes set forth.

Second, The use of the carriage, b, when used in combination with the twisters, I, reels, v, and cam wheel, A, as described and set forth.

Third, The use of guides, H, when used in connection with the carriages, b, and ways, 11, as described and for the purpose set forth.

Fourth, The combination of the take-up reel, B, ratchet wheel, C, ratchet pawl, D, and frame, c, when arranged, constructed and operated in the manner specified, for the purpose set forth.

27,924.—P. A. Morley, of Brooklyn, N. Y., for an Improvement in Lanterns:

I claim the arrangement of the sides, N N1 N2 N3, loops, a a1 a2 a3, and rods, b b b b, in relation to the top and bottom of a lantern, in the manner and for the purpose specified and shown in the accompanying drawings.

27,925.—Milo Peck, of New Haven, Conn., for an Improvement in Atmospheric Hammers:

I claim interposing a wooden planking or other non-conducting material between the frame which supports the mechanism of a trip hammer, and the bedpiece which forms the common foundation of the frame and the anvil, substantially as described, for the purposes specified.

27,926.—Jonas Perkins, of Braintree, Mass., assignor to N. S. C. Perkins, of Norwalk, Ohio, for an Improvement in the Driving Mechanism for Sewing Machines:

I claim the method, substantially as described, of communicating power to sewing machines by means of self-locking and unlocking clutches or wheels, arranged, the one to drive the other in one direction only, when said clutches are hung for independent and joint rotation on separate shafts or distinct axial bearings—the one of which is attached to a lifting or opening and closing portion of the machine, and the other disconnected therefrom, for the double purpose of preventing the machine from being improperly driven backwards, and to facilitate the exposure of the underwork; also whereby the machine, when driven by a band or belt, may be opened without unshipping the band.

27,927.—Jehu Mitchell, of Aleppo township, Pa., for an Improved Churn:

I claim the arrangement of the gearing, E M, standard, D, hinged cap, G, vertical dasher, J N, and collar, L; the whole being constructed and combined in the manner and for the purposes before set forth.

27,928.—E. B. Requa, of Jersey City, N. J., for an Improvement in Horse-powers:

I claim the arrangement of the hollow rims, I, in combination with the toothed rims, H, cog-wheels, G, chains, c, chain wheels, E and E′, and endless apron, A, constructed and operating substantially as and for the purpose specified.

27,929.—John Robinson, of Eli, of Sharptown, Md., for an Improvement in Seed Planters:

I claim the combination of the clutch rod, O, and wire, S, with trigger, n, at the handle, G; the whole arranged and operating in connection with the adjustable indicating wheel and dropping devices substantially as described.

27,930.—R. E. Rogers, of Philadelphia, Pa., for an Improvement in Steam Generators:

I claim constructing steam generators or boilers of the rings as set forth, either alone or in combination with the interior sheet, substantially as described.

27,931.—H. S. Root and T. Lloyd, of Muncy, Pa., for an Improvement in Straw-cutters:

We claim the combination of a vibrating box with a stationary knife, when the whole is arranged so as to cause the weight of the box and its contents to assist in producing the cut, as hereinbefore described.

We also claim the combination of the vibrating racks, P and Q, with the gears, o and p, or their equivalents, substantially as hereinbefore described, for the purpose of feeding the material intermittently, as hereinbefore specified, for the purpose set forth.

27,932.—Jefferson Short, of Leavenworth, Kansas Territory, for an Improvement in Machines for Crushing Quartz:

I claim the application and combination and arrangement of a series of crushing wheels combined with balance wheels or dead weights, so arranged on endless track that motion will be uniform on said track, as described in Fig. 2 of drawing, by means of coupling the ends of shafts together, and revolving cylinder with boxes in which axis of shafts revolve at center, one independent of the other.

And I further claim the invention of the double revolving cylinder, which revolves independent of upright shaft and driving wheel.

I do not claim the invention of the wheels, but the arrangement and combination of the same as described in specification and drawings.

27,933.—Horace Smith and D. B. Wesson, of Springfield, Mass., for an Improvement in Filling Metallic Cartridges:

I claim a cartridge in which fulminate is contained in the hollow, annular, projecting base, substantially as described, without being previously inclosed in a hollow metallic ring.

27,934.—Wm. Steinmetz, of Philadelphia, Pa., for an Improvement in Eyelet Machines:

I claim giving a sharp, angled, pointed shape to the extremity of the shank, d, of the punch of my improved eyelet machine, when the said punch is otherwise of the shape represented in the accompanying drawings and when it is used in connection with a perforated die plate, substantially in the manner and for the purpose set forth.

27,935.—John Taney, of Austin, Texas, for an Improvement in Apparatus for Boring Artesian Wells:

I claim combining with the tubes, B and E i i, which are provided with arms, H H and H2, and with dovetail grooves in their surfaces, valves, U R and D, valve piston, F2, and solid piston, F, in the manner and for the purposes specified.

27,936.—Wm. Thompson, of Detroit, Mich., for an Improved Forge Bellows:

I claim the arrangement in cylinder, A, of partitions, F F′, with their valves, H H′ and I I′, and central partition, J, when the same are combined and a blast of air is obtained substantially in the manner and for the purpose described.

[This invention consists in the employment of a cylinder of metal or other suitable material, of a suitable size, having two compartments in each end, communicating with the interior of the cylinder by valvular openings, and with the outer air at one end and with the forge at the other end; said cylinder to be partially divided longitudinally by an air-tight diaphragm or partition, and to be partly filled with water or other liquid, so that by giving to the cylinder a vibratory or rocking motion, air will be alternately drawn into the cylinder, on each side of the diaphragm, from one end, and forced out at the other end, by virtue of the contained fluid always keeping its equilibrium on each side of the diaphragm. In this manner a continuous blast of air may be obtained.]

27,937.—J. S. Tripp, of Danby, N. Y., for an Improved Saw-filer:

I claim the specific device described for beveling the tooth of the saw, namely: the angle, I, the projections, O O, and the pin, K, attached and operated as described.

27,938.—W. C. Turnbull, of Baltimore, Md., for an Improvement in Compressed Air Engines:

I claim the application to compressed air engines of an expansion cut-off which is operated by a positive motion, but the stroke of which is regulated automatically by the pressure of the air in the holder or reservoir, so as to admit a volume of air of a certain density directly to and allow it to expand in the cylinder, for each stroke of the piston, as is necessary to drive the engine at a certain speed, substantially in the manner described.

27,939.—P. L. Weimer, of Lebanon, Pa., for an Improved Mode of Actuating Governor Valves of Steam Engines:

I claim the movable rockshaft, I, operated in the manner set forth, by means of the levers, F, attached to the governor spindle, D, and sliding boxes, H, as described and specified.

I also claim actuating the rockshaft, I, by means of an eccentric on the engine shaft, when used in combination with the sliding boxes, H, and levers, F, attached to the governor spindle, D, as described and specified.

I also claim the rods, O, working through the plate, P, with the jam nuts, R, india-rubber buffer, S, and spiral spring, U, with the adjusting jam nuts, Q, in combination with the arm, N, on the valve rod, L, for the purpose as herein more fully described and specified.

27,940.—I. P. Wendell, of Philadelphia, Pa., for an Improvement in Journal Boxes:

I claim, first, The double washer, E, of leather or other suitable material, the wedge-formed strap bolt, G, and the follower, H; the whole being arranged within the chamber, D, of a journal box, substantially in the manner and for the purpose set forth.

Second, The follower, H, and the bent strip, E, in combination with the packing, E, and strap bolt, G—the whole being applied to the journal box in the manner and for the purpose specified.

27,941.—George Westinghouse, of Schenectady, N. Y., for an Improvement in Grain Separators:

I claim the combination of the carriers, D and E, the carrier, D, resting on the inner end of carrier, E, whether the carriers are suspended from the thresher frame or otherwise—operating as described for the purpose set forth.

[This invention consists in a novel arrangement of two carriers or screws connected with the thresher, whereby the parts may be readily adjusted or set in proper working position and made to operate in the most efficient manner.]

27,942.—C. K. Williams, of Haddonfield, N. J., for an Improved Washing Machine:

I claim, first, The arrangement of the adjustable dividing board, I, with the levers, J J, the board being so secured as to slide up and down between guides attached to the levers, substantially as and for the purpose set forth.

Second, The arrangement with the shaft, D, of the springs, a a, made to operate upon different sides of said shaft, and the weights, d d, when the same are used as and for the purpose set forth.

27,943.—Hiram Abbott (assignor to himself and L. A. Lyon), of Wakeman, Ohio, for an Improvement in Heading Bolts:

I claim the adjustable jaws, B, the header and follower, a b, and the guides, D, operating as described and for the purposes set forth.

27,944.—W. W. Allen and James Molyneux (assignors to themselves and J. L. McKnight), of Bordentown, N. J., for an Improvement in Sewing Machines:

We claim a circle with teeth on its periphery to feed the cloth or material being sewed, when said circle is arranged to turn on a stationary ring through which the needle may be threaded, whether said circle is arranged above or below the cloth.

27,945.—Henry Belfield (assignor to himself and S. W. Hoffman), of Philadelphia, Pa., for an Improvement in Pumps:

I claim the shaft, D, its two cranks, d and d′, in combination with the rods, G and G′, and valved buckets, I and I′, and their valves, A and A′; the whole of the parts being constructed and arranged as set forth, so that a simultaneous reciprocating motion, in contrary directions, may be imparted to the said buckets by the rotation of said shaft, D, and so that the two barrels may be in a direct line with each other.

27,946.—James Blake (assignor to himself and Henry Blake), of East Pepperell, Mass., for an Improved Auger:

I claim the combination, with extensible cutter bar, G, of the screw enlargement, C, with or without the center point, D; the same being arranged as and for the purposes set forth.

[This invention and improvement in augers consists in forming on the end of the auger shank or stem an enlarged cylindrical portion, having a suitable screw thread cut on it, and a short spiral groove, terminating in a radical cutting point on the end of the auger and a conical screw point which serves to center and start the auger; while the cutter on the end of the cylindrical screw portion serves to cut a hole corresponding in diameter to their enlargement, through which enlargement passes an adjustable cutter, which immediately succeeds the screw on the enlargement, and forms a hole in size according to the distance the cutting end is set from the axis of motion.]

27,947,—J. W. Briggs (assignor to himself and J. W. Joralemon), of Cleveland, Ohio, for an Improvement in Window-sash Supporters:

I claim the combination, construction and arrangement of the double-acting spring bolt, C, with the frame, A, drum, B, coiled spring, F, leather strap, R, and friction roller, S, substantially as described, for the purposes set forth.

27,948.—C. G. Cross (assignor to himself and G. H. Bailey), of Chicago, Ill., for an Improvement in Tension Apparatuses for Sewing Machines:

I claim the employment, in combination with a friction apparatus for producing tension on the thread, of a lever, D, through or in contact with which the thread passes, in such a manner that any tendency to irregularity in the friction is counteracted by the consequent irregularity of the draft of the thread upon the said lever, substantially as described.

27,949.—L. C. English, of Canton, N. Y., assignor to himself and G. M. Angier, of Washington, D. C., for an Improvement in Stump Extractors:

I claim, first, The described stump extractor, provided with two sets of gearing, consisting of shafts, L M, with their spur wheels, cog wheels and clutches: all arranged and operated substantially as set forth for the purposes described.

Second, I claim the use of the wheels, S and U, in combination with the double gears above claimed, substantially as described for the purposes specified.

Third, I claim the adjustable wheels, E, in combination with the foot pieces, D, substantially as described.

27,950.—D. G. Fletcher (assignor to himself and James Yates), of Racine, Wis., for an Improvement in Heat Radiators:

I claim the arrangement and combination, as shown and described, of the perforated conical cylinder, C, registers, F G, air space, E, within the drum, A, for the purpose specified.

[This invention in an improvement in heat radiators through which the smoke and heated air, ascending from a furnace or ordinary stove situated in the lower story of a building, is to be conducted for economizidg fuel by abstracting the heat from the products of combustion in the upward passage, and radiating it into the room. The invention for effecting this object consists in combining with a cylindrical drum a partially perforated and conical lining or inside cylinder, and, in conjunction with these two cylinders, peculiarly arranged registers, whereby the draft may be perfectly controlled.]

27,951.—E. F. M. Fletcher, of Georgia Plains, Vt., assignor to himself and J. M. Edny, of New York City, for an Improvement in Windmills:

I claim the employment or use of the cone, L, applied to the revolving cap, C, and placed relatively with the windwheel, H, and gearing, E F, to operate as and for the purpose set forth.

27,952.—Joseph Koehler (assignor to himself and Heinrich Soltmann), of New York City, for an Improved Head Gear for Stopping Runaway Horses:

I claim the combination of the blinders, g, compression pads, o, sliding rod, n, and inclines with the check rein, h m, and collar, i, substantially as set forth.

27,953.—George Munger (assignor to himself and E. P. Dean), of New Haven, Conn., for an Improved Machine for Polishing Wood:

I claim combining with suitable rotating smoothing disks, adjustable or self-adjusting feed and pressure rollers, for the purposes and essentially in the manner set forth.

27,954.—E. W. Tarbell (assignor to himself and Edwin Simonds), of Boston, Mass., for an Improved Steam Boiler:

I claim the combination and arrangement of the water and steam space, a, the transverse water space, b, and the series of bent connection tubes, c c, the furnace, d, the smoke or heat chamber, e, and the connection tube or tubes, f; the whole forming an upright boiler or steam generator.

27,955.—J. P. Woods, of Troy, N. Y., assignor to himself and A. Johnson, of Parkman, Ohio, for an Improved Cooper's Tool:

I claim the described barrel head-parer, consisting of the stock, A, bit, B, tooth, C, slider, E, and thumb screw, F, when the several parts, or their equivalents, are constructed and arranged as specified, and operating in the manner and for the purpose set forth.

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RE-ISSUE.

S. S. Gray and S. A. Woods (assignees of S. S. Gray), of Boston, Mass., for an Improved Machine for Planing Lumber "out of Wind." Patented Aug. 22, 1854:

We claim, first, The peculiar construction of cutter head described, the cutter head itself being made use of to turn and break the shaving in the manner of a double iron plane, and being, furthermore, made concave, for the purpose of facilitating this operation.

Second, The clamp, as described, for the purpose of dogging the lumber to the bed of the machine; the body of the clamp being pivoted at d, and forced up by the screw, F, or its equivalent; the dog, h, being adjustable therein in the manner and for the purpose set forth.

Third, The described method of securing the dog, M, to the bed of the machine, by means of the teeth or cogs, l, and the mortises in the side pieces, m, for the purpose set forth.

Fourth, I claim the bar, D, or its equivalent, in combination with a rotary cutter head, and traveling bed, I, provided with suitable dogs, for planing straight and "out of wind," substantially as set forth.

EXTENSION.

S. F. B. Morse, of Poughkeepsie, N. Y., for an Improvement in Electro-magnetic Telegraphs. Patented April 11, 1846:

I claim the employment, in a main telegraph circuit, of a device or contrivance called the "receiving magnet," in combination with a short local independent circuit or circuits, each having a register and a register-magnet, or other magnetic contrivances for registering and sustaining such a relation to the register-magnet or other magnetic contrivances for registering, and to the length of circuit of telegraph line, as will enable me to obtain with the aid of a main galvanic battery and circuit, and the intervention of a local battery and local circuit, such motion or power for registering as could not be obtained otherwise without the use of a much larger galvanic battery, if at all.

Second, I also claim, as my invention, the combination of the apparatus called the "self-stopping apparatus," connected with the clock-work of the register, for setting said register in action, and stopping it with the pen lever, F, as described.

Third, I also claim, as my invention, the combination of the point or points of the pen and pen lever, or its equivalent, with the grooved roller, or other equivalent device, over which the paper or other material suitable for marking upon, may be made to pass, for the purpose of receiving the impression of the characters, by which means I am enabled to mark or print signs or signals, upon paper or other fabric, by indentation, thus dispensing with the use of coloring matter for marking, as specified in my Letters Patent of Jan. 15, 1846.

William Wheeler, of New Britain, Conn. (formerly of West Poultney, Vt.), for an Improvement in Curry-combs. Patented April 25, 1846:

I claim the so combining of the trough-like bars which constitute the comb teeth, with the other parts, in the manner set forth, as to constitute a curry-comb with an open back. I do not claim the trough-like combs or the hollow back, individually, but only in their combination, as herein fully made known.

NOTE.—THIRTY of the patents reported in the above official list were secured through this office. Last week FORTY-SIX of the number issued were obtained through the same source; and on the second week previous, FORTY-ONE, making a total of ONE HUNDRED AND SEVENTEEN Letters Patents issued to the clients of MUNN & Co. in three weeks.

Notes & Queries.

T. J. K., of Va.—You say that if a stone is dropped from a point as high as one can reach in a railroad car, it will fall on that place in the floor over which it is held, notwithstanding that the car may have moved some distance while the stone was falling; and you ask for an explanation. A universal property or law of matter is inertia, by which all bodies at rest are disposed to remain at rest, and all bodies in motion are disposed to continue in motion in the same straight line, unless some force acts upon them to change the state of rest or to change the direction or velocity of the motion. The stone moving along with the car continues this motion simply because there is nothing to prevent it from doing so. In regard to the table, we think it was raised by the involuntary and unconscious contraction of your own muscles and those of your associate, while you supposed that you were holding it down.

B. B. H., of Mass.—The letter of A. J. H. has gone to the paper-makers, and we do not remember his full name.

C. C., of Mass.—Take a solution of nitro-muriate of gold (gold dissolved in a mixture of acquafortis and muriatic acid) and add to a gill of it a pint of ether or alcohol, then immerse your copper chain in it for about 15 minutes, when it will be coated with a film of gold. The copper must be perfectly clean and free from oxyd, grease or dirt, or it will not take on the gold.

J. G., of Ind.—Our Philadelphia correspondent's idea of saving steam by compression was this:—When all the steam is exhausted from the cylinder of a steam engine, as the steam flows in from the boiler it must fill the space between the induction valve and the piston head with steam which does no work, thus wasting it. Now, if this is filled by steam compressed from the previous stroke to a density corresponding with that in the boiler, when the steam first begins to enter the cylinder, it will begin to exert its full power on the piston, and the compressed steam will exert a force in expanding equal to that required to compress it.

F. G. D., of N. Y.—Your assignment, to hold good against a subsequent purchaser, should be recorded in the Patent Office within three months from the date of execution. An assignment holds good against the seller for any length of time, whether recorded or not; but if he should sell the same interest to another person, and the second purchaser should get his assignment on record at the Patent Office, the first purchaser would be deprived of his legal rights under his assignment, and his only remedy would be to recover damages against the person from whom he purchased for fraud, in selling the same property to another which he had conveyed to him.

E T. Q., of N. H.—In regard to planets falling together, the several principles which you cite are undoubtedly correct, and they would settle the point as you suppose, were the earth held by some power stationary. But, as in each case supposed, the earth falls as well as the pebble or the sun, as the power drawing the two bodies together exerts the same force on each, and as the inertia to be overcome is proportioned to the mass, is it not plain that the greater motion—in other words, the greater velocity—must be imparted to the smaller body.

M. S., of S. C.—We advise you to employ sand for the bedding of your horses instead of straw. We believe sand to be a better article for the preservation of the hoofs of horses.

E. G. W., of Mass.—You will find a description of the method of making liquid quartz and dental paste for teeth in another column.

J. M., of Cal.—We have never seen Liebig's "goldometer," and there is no instrument known to us for testing the purity of gold. The only sure way of doing this is by assaying it.

C. B., of Ohio.—You can use a cast iron mold for casting iron in, if you smoke the inside, but wrought iron forms the best mold for such castings.

C. & I., of N. Y.—If you had detailed experiments with the soluble glass, they would have been valuable as new information; but the same information which you communicate was published on page 70, Vol. XIV. (old series), of the SCIENTIFIC AMERICAN.

W. D. F., of Texas.—If you wish to obtain some seeds from the Patent Office, write to Hon. Thomas G. Clemson, Washington, D. C.

M. A., of Maine.—A model of the size you specify would be received at the Patent Office. You can send it to us with the patent fee by express, and we will proceed with the case at once.

C. D. P., of Conn.—In Vol. I. (old series) of the SCIENTIFIC AMERICAN—fourteen years ago—the illustration of a traction engine was published. The invention, you perceive, is not so recent as you imagine.

G. C., of Oxford.—We do not know of any machine capable of dressing the fingers commonly used in grain cradles. It is all done by hand, and is a tedious and laborious work.

D. B. W., of L. I.—A strip of copper and a strip of zinc, united together by a copper wire, form a simple galvanic battery, when properly placed in a decomposing solution.

W. R. S., of Pa.—Your battery, which has an outer zinc cell, containing sulphuric acid, and an inner porous cup containing nitric acid, in which is placed the negative strip of platina, is called Groves', after its inventor, Professor Grove, of London. Silver plated articles, by the galvanic process, are rendered bright by rubbing their surfaces with a common burnishing tool.

J. H. A., of Mich.—A durable mucilage is made of roasted starch. Oil of cloves has a preservative power in any of the ordinary kinds of mucilage.

AQUA REGIA, of N. Y.—We have seen gold 24 carats fine.

L. W. R. B., of S. C.—Asphaltum does make a solid and durable cement for brick walls in damp places. It is extensively used for that purpose in this city. You can get it of Reynolds, Devoe & Pratt, No. 106 Fulton-street, this city. They have two qualities—one at seven cents and the other at four cents per pound.

W. J. L., of N. Y.—If you have any works on astronomy which assert that the sun completes the circle of the ecliptic in a tropical year, they are certainly in error. This revolution measures a siderial year. You will find on page 200 of the present volume of the SCIENTIFIC AMERICAN, directions for constructing a very simple apparatus which will make this matter all plain to you.

C. C. P., of Ohio.—You can give any depth of black walnut stain to wood by using decoctions of logwood of different degrees of strength. The finishing of furniture in the best style depends upon the use of "elbow grease"—good rubbing and polishing after varnishing.

S. S., of Va.—There is no work published in this country containing colored plates for painters and others, illustrating the different colors and shades for house-painting.

A. G., of Zornhoff.—We have no American work that would be altogether instructive to you on sawmills. The back volumes of the SCIENTIFIC AMERICAN contain more useful information on circular and other sawmills than any work extant.

F. G., of N. Y.—Patents are granted on trade-marks as well as on other ornamental designs. The government fee for a design patent is $15. The specifications for such patents are prepared at the office of this paper.

W. R., of Pa.—Articles that are silver-plated by the electrotype process have a dull, frosted surface, which is rendered bright afterwards by rubbing the surface with a common burnishing tool, slightly moistened with water.

R. F. W., of C. W.—Practically, we have no doubt that a piston rod is at rest for a brief space of time on the dead point, though, if the machinery were absolutely perfect, it would not be. Some mechanicians say it would be at rest for an "infinitely short space of time," but that is a phrase which has no meaning. Time may be infinitely long, as in fact it is, but it cannot be infinitely short.

D. J. T., of Miss.—Some plaster-of-paris mixed with lac varnish will make a quick-drying and water-proof cement for leather, but it will not adhere long. No very adhesive cement, with which we are acquainted, will dry immediately after it is put on. India-rubber dissolved in naphtha, and made into a proper consistency with Paris white, may suit your purpose. Let us hear from you regarding the pegging machine—how it operates, and how much work it can do.

W. B., of Ohio, asks as follows:—"Suppose A owns the patent for a certain drain plow, and B gets a machine that infringes A's patent, and C employs B to cut some drains for him, and pays B a certain price per rod. Can A hold C liable for damages, or must he look to B alone for damages?" Answer.—A must look to B, alone, for damages.

S. A., of Va.—Glycerine is sold in all the druggists' stores in this city, but most of it comes from London. There is one manufactory in Philadelphia, where a very pure article is made. At retail, very high prices are charged. We have paid 50 cents for a pint of it.

H. K., of Minn.—The stone which you send us is agate. Some agates of a fine quality are ranked among the precious stones, but this specimen is simply colored quartz and is of no value whatever. We shall, however, keep it for a while, subject to your order.

M. L. C., of Conn.—To make vinegar from alcohol, you must use spongy platinum, not the clear metal. Place the platinum in a glass jar, and introduce the alcohol in drops, so as to fall on a saucer containing the platinum, when slow combustion will soon take place, and the vapor which condenses on the glass will be pure acetic acid. The alcohol should be heated to 90° Fah. Great quantities of acetic acid used to be manufactured in this manner in Germany.

J. T., of Ill.—You can make copal varnish quick drying if you use litharge, sugar of lead or sulphate of zinc in the boiled oil which you employ with the gum copal. Unless your varnish is laid on in several coats, and each thoroughly dried, it will not take a good polish. You can polish any kind of wood highly, without any varnish at all, by rubbing the surface with a smooth piece of cork and some oil. Gum shell-lac, dissolved in alcohol, makes a very hard varnish, but it cracks when it becomes old.

C. C. P., of Ohio.—The metal which you send us is iron. If you found it in a little yellow cube it was the bi-sulphuret of iron; that is, a combination of sulphur and iron in the proportion of 28 ounces of iron to 32 ounces of sulphur (Fe S2).

W. H. R., of N. Y.—We think that a water tank made in the usual way with bricks, and lined with cement, will answer for containing hot water quite well, if it is well made. The water should be heated in a separate vessel; and when the cement is new, it will make the hot water rather hard for washing purposes.

J. E. S., of N. Y.—It is the oxyd of zinc which is employed for painting. If you give two coats of white lead, then the third and last of white zinc on the outside, you will have a very durable and beautifully painted cottage. We are of opinion that the zinc is not so durable for the prime coating as white lead.

W. A., of N. J.—Plaster-of-paris made into a paste, with a weak solution of alum and some marble dust added, is a good cement for marble blocks, &c. A solution of glue, marble dust and plaster-of-paris, made into a cement, is employed for making composition marble ornaments.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, April 21, 1860:—

E. P., of N. Y., $30; J. R. I., of N. Y., $55; D. F., of Pa., $10; D. N., of N. Y., $30; A. D., of N. J., $30; G. P. McC., of Pa., $25; D. C. J., of N. Y., $25; T. & S., of Ill., $30; H. M. J., of Conn., $30; J. F., of N. Y., $30; J. S., of Wis., $25; J. H. D., of Ky., $60; H. P., of N. J., $25; C. A. H., of Mich., $30; D. G. P., of N. J., $20; J. C., of N. Y., $38; J. C., of Mass., $25; J. B. McC., of Iowa, $25; N. M., of Ohio, $30; J. H., of Pa., $50; H. M., of N. Y., $30; P. L. W., of Pa., $30; J. P. A., of Ga., $30; H. G., of Mass., $25; J. S., of N. Y., $100; D. G., of Ill., $25; J. G., of La., $100; T. W., of R. I., $12; S. J. S., of N. Y., $45; W. F., of Mass., $60; J. G. W., of Ga., $30; E. & R., of Ill., $30; H. J. C., of Mass., $250; W. McA., of Mich., $25; G. H. K., of Pa., $30; G. F., of Ill., $25; A. K., of Ill., $25; W. B., of Vt., $30; T. H., of N. Y., $30; G. D., of Ill., $25; R. H. M., of N. Y., $100; H. J. I., of Ill., $25; J. D., of N. Y., $30; G. W., of Pa., $25; G. C., of Ill., $25; J. E. M., of N. Y., $55; D. C. J., of L. I., $30; A. P. P., of Conn., $181; H. M. W., of Conn., $25; F. & P., of Ind., $25; H. W., of N. Y., $30; J. C. P., of Maine, $20; R. & S., of Ala., $25; T. H. B., of Mo., $35; J. A., of N. Y., $30; R. C. B., of N. Y., $25; C. L. W., of Fla., $30; A. J. G., of Mass., $30; W. B., Jr., of N. Y., $275; W. N. M., of Mass., $30; S. L. A., of N. Y., $25; D. T., of Mass., $50; J. M. B., of Conn., $30; W. R., of Ohio, $30; L. K., of Conn., $25; O. F., of Ind., $30; R. B., of N. Y., $30; O. K., of N. Y., $30.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, April 21, 1860:—

B. & B., of Mass. (two cases); J. C., of Mass.; A. K., of Ill.; F. & P., of Ind.; J. C., of N. Y.; J. S., of Wis.; O. L. & J. W. T., of N. Y.; A. J. G., of Mass.; J. E. M., of N. Y.; C. & B., of Iowa; J. B. McC., of Iowa; G. F., of Ill.; W. McA., of Mich.; T. W., of R. I.; G. W., of Pa.; G. D., of Ill.; A. F. R., of Ill.; H. J. C., of Mass; R. & S., of Ala.; D. H., of N. Y.; J. G. W., of Ga.; J. R. I.; of N. Y.; J. H. I., of Ill.; R. C. B., of N. Y.; W. F., of Mass.; D. G. P., of N. J.; H. M. W., of Conn; P. G. McC., of Iowa; J. H. H., of Vt.; D. S., of N. Y.; H. G., of Mass.; J. D., of N. Y.; H. P., of N. J.; D. G., of Ill.; P. M., of Conn. (three cases); D. T., of Mass.; E. & K., of France; S. L. A., of N. Y.; L. K., of Conn.; C. & G., of France; J. C. P., of Maine.

Literary Notices.

THE WAR IN NICARAGUA—written by General William Walker. Published by S. H. Gortzel & Co., Mobile, and No. 82 Warren-street, this city.

By the receipt of this book, we perceive that this little, light-haired, drawling freebooter is still out of prison.

HITCHCOCK'S ANATOMY AND PHYSIOLOGY—published by Ivison, Phinney & Co., Nos. 48 and 50 Walker-street, this city.

This is no doubt one of the best class books for teaching the important subjects of which it treats. It is compiled and prepared by the venerable Dr. Hitchcock, of Amherst College, and his son, Edward Hitchcock, Jr., M.D.

A TREATISE ON ELEMENTARY AND HIGHER ALGEBRA—by Theodore Strong, L.L.D., Professor of Mathematics and Natural Philosophy in Rutger's College, New Brunswick, N. J. Published by Pratt, Oakley & Co., No. 21 Murray-street, this city.

The author says:—"Great pains have been taken to present the principles and processes of the science in so clear a manner that the student may readily understand them." He also claims to have made some important additions to the science of algebra. "Thus, at page 512, &c., a new and general method is given for the development of the roots of equations, which seems to be much more simple than any heretofore proposed."

WELLS' LAWYER AND UNITED STATES FORM BOOK. Published by John G. Wells, corner of Park-row and Beekman-street, this city.

The plates of this standard work having been recently destroyed by fire, the opportunity has been taken to give it a thorough revision, adapting it to the statutes in force at the present time in the several States. It contains forms for deeds, wills, bonds, &c., with brief and plain statements of the laws in relation to the transactions in which the forms are to be used. We find in it a summary of the laws for the collection of debts in the several States, the qualifications of electors, the law of landlord and tenant, the forms for patent proceedings; and, indeed, instructions for conducting legally the multifarious transactions of business and of life. It is sent by mail to any part of the country for $1.

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Rates of Advertising.

THIRTY CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

NEW & SLATER'S OSCILLATING CABOOSE.—The undersigned take this method of informing the shipping community of the city of New York and of the United States that they are prepared to furnish their oscillating caboose. Of its advantages we need not speak; it needs only to be seen to be fully appreciated, as it possesses many highly important advantages over everything of the kind now in use. It maintains a level position under any circumstances, is adapted to burning either wood or coal, and possesses double the draft of the ordinary caboose. If it were necessary, we might produce numberless testimonials of the highest character, in relation to its utility. Capt. F. H. Gregory, U. S. N., speaks of it in the following most flattering terms. He says:—"It appears to me, from what experience I have had, to obviate many objections to the stationary apparatus used on shipboard, the inconveniences which I have observed being entirely done away by your ingenious invention." Capt. M. Munson, of New Haven, Conn., on board of whose vessel it was thoroughly tested at sea, speaks of it in the following terms. He says:—I consider that, from the test I have given it, having used it in my own galley, nothing is wanted to make it THE caboose; just the thing that has long been needed; one that will meet all the wants and fulfil the highest anticipations of all seafaring men, in so far as it relates to comfort and convenience in this department." We could multiply references and testimonials, but feel that it is unnecessary. We are prepared to furnish a caboose of any size, together with all the necessary furniture, upon liberal terms. A reasonable discount will be made to the trade throughout the United States. We would also offer for sale our patent for three States. For full particulars, address NEW & SLATER, No. 31 Fulton-street, New York. 1*

A WASHING MACHINE THAT IS SIMPLE, thorough and triumphant over all others with which it has come in contact. Cut and circular sent, on application to Mr. VAN AUKEN, patentee, Amsterdam, N. Y. Price of machine, $8 and $10. 18 4*

INVENTOR'S GUIDE.—HENRY C. BAIRD, Philadelphia, publishes "The Patent Office and Patent Laws, or a Guide to Inventors." By J. G. Moore. Price $1. Sent by mail free of postage. 1*

FOR THE DEAF—FOR THE DEAF.—ARTIFICIAL ears; entirely concealed, Call at, or address, HASLAM BROS., No. 420 Broadway, New York, for a descriptive and illustrated circular. 18 2eow*

VALUABLE WORKS FOR MECHANICS AND BUILDERS.—Riddell's "Elements of Hand-railing, Stair-building, Carpentry," &c., is the most complete and practical work extant. Any carpenter can acquire the whole art in a few days and save ten times the cost of the work; 22 plates, with full and clear explanations. $2 50, postpaid.

Bell's "Carpentry Made Easy" teaches a new system of framing, by simple and exact rules, given with mathematical precision, in language free from technical terms, so that any one can understand them; 38 plates. $3 postpaid.

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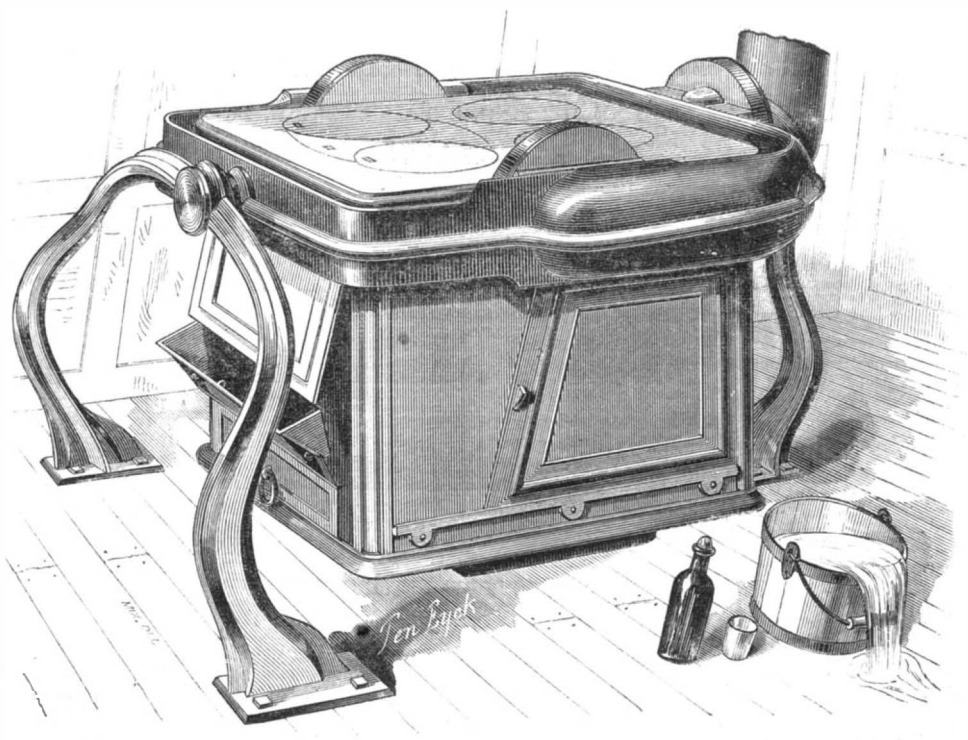
IMPROVED SHIP'S STOVE.

On page 160, Vol. XIV. (old series) of the SCIENTIFIC AMERICAN, we described an invention for hanging a ship's galley stove in a ring, similar to the gimbal of a compass, in order to keep the top of the stove level when the vessel is rolling in a rough sea. The plan consisted simply in suspending the stove in a ring by two pivots or trunnions, and then suspending the ring by two pivots at right angles to the former two so as to allow the stove to swing in both directions and thus maintain its level position. One half of the ring is made hollow to act as a flue, the joints which connect the stove with it of course being hollow, as well as the joint which connects this hollow half of the ring with the stationary portion of the flue. This invention was made by D. S. Beardsley, who sold the patent, and the present owner, finding the stove a success, and receiving abundant testimonials from shipmasters of character who have tried it, that the invention is useful and valuable, has been devising a little improvement in details of construction, which is the subject of the present patent.



SLATER'S IMPROVED SHIP'S STOVE.

In the original plan, the hollow joints were cast upon the stove and upon the ring; and, consequently any wear or injury which destroyed these small parts had the effect to ruin the stove. By the new method, these joints are cast separately, movable sockets being inserted into the sides of the stove, into which are fitted short tubes or thimbles, the thimbles having dovetailed flanges upon their ends to secure them to the hollow half of the ring. By a similar joint the hollow portion of the ring is connected with the stationary portion of the flue. The opposite joint of the ring is an ordinary solid swivel joint.

This stove has been thoroughly tested at sea, and all who have tried it pronounce it an admirable improvement, promoting very materially the convenience and success of cooking at sea—a somewhat important operation either on land or ocean.

The patent for this improvement was granted to Geo. W. Slater, through the Scientific American Patent Agency, Dec. 20, 1859, and further information in relation to it may be obtained by addressing New & Slater, No. 31 Fulton-street, this city. Patents have also been taken out through our agency in the principal countries of Europe.

An advertisement of this improvement appears in another column.

PLASTIC FILLINGS FOR TEETH.

The following useful information is taken from an article in the "Dental Cosmos," communicated by H. L. Runkle, of Culpepper, Va:—

"Lately there have been introduced to the dental profession a number of preparations styled osteoplastic, bone, and quartz fillings. The composition of these new materials is similar; all of them are formed from soluble glass, mixed with powder, the base of which is either the oxyd of zinc, in a freshly prepared state, or the precipitated sulphate of baryta. My attention was first called to the soluble glass, compounded with powders, in 1853, by an eminent chemist of Berlin, Prussia. The process by which he obtained it was fusing thoroughly fifteen parts quartz, ten of potash, and one of charcoal. In this state it was a hard and clear substance. It was then divided into minute particles, and dissolved by steam, forming a clear and sirupy liquid. With this liquid he would unite a powder, the base of which was the oxyd of zinc or precipitated sulphate of baryta, and from this plastic material would, in a short time, produce a substance as hard as marble. He sometimes employed lime, in connection with the soluble glass, which readily consolidated, having a tendency to form silicate of lime. With these preparations, in various forms, I experimented in numerous cases, to test their durability as fillings for teeth. The result was, that in some mouths the fillings would wash away in a few months. When this was not the case, and the filling remained and presented a solid appearance, upon its removal, the walls of the cavity would be found to be in a chalky and brittle condition, very much injured, and in such a manner as to be difficult to remedy. This was invariably the case when they remained in from 18 to 20 months. I have examined three of these new preparations, said to be recent discoveries, and find them in substance the same, with the exception that they are more objectionable from the fact that they are not chemically compounded. I therefore expect their use will be of short duration among the scientific members of the profession."

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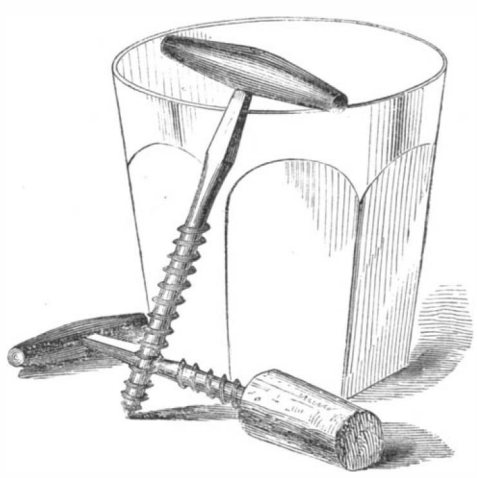

have made the stockholders rich, and we see by the papers that they have recently been consolidated into one concern, which will doubtless conduct its profitable operations on a still more enlarged scale than when existing as rival companies. We are reminded of these facts by the new use to which wood screws are adapted by the invention which we here illustrate.

It is simply a new kind of corkscrew, which is made by attaching a handle to the common gimlet screw. Experience has taught almost every one that ordinary corkscrews are very liable to be broken, especially when used for severing the wire which is employed for securing corks in bottles. The principal advantage in this screw is its greater strength, cheapness, and adaptation for the smallest phials, as well as for the hardest bungs of casks. When we consider that there are seven millions of corks used annually in the city of London, we see that even so small an article as a corkscrew may be in the magnitude of its numbers a very important affair.—A successful inventor recently remarked to us that, if a man had the monopoly of any one thing in this country, even if it is not larger than the head of a pin, he is secure of a fortune.

The patent for this invention was obtained (through the Scientific American Patent Agency) on March 27, 1860, and persons desiring further information in relation to it may address the inventor, Dr. M. L. Byrn, No. 66 Nassau-street, this city.

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